C-Reality Film Scanner

User Handbook

Issue 1

While every effort has been made to ensure that the contents of this document are accurate Cintel International equipment is under constant review to bring about improvements in design, and a unit may differ in detail from that described.

Chapter 1 - Introduction

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Introduction

Your C-REALITY Telecine (shown in Figure 1) is a multi-resolution film scanning system that employs the very latest imaging technology. It provides images of uncompromised quality, while maintaining the versatility that you would expect from a Cintel telecine.

C-REALITY incorporates Standard Definition, 2K Data and C-VIP, (C)olour (V)ector (I)mage (P)rocessing

C-VIP is a powerful built-in colour processing system that provides colour correction at 14-bit resolution regardless of system standard.

Control

Although designed to be operated from a remote control desk C-REALITY can also be controlled and configured from the Local Control Panel where much of the desk's functionality is replicated. C-REALITY supports control desks from the following manufacturers:

- Da Vinci
- Pandora.
- Tangent

Please contact manufacturers for specific details.

About This Handbook

This handbook, C-REALITY - User Handbook, is Volume 1 and is intended for the user and operator and provides:

- a specification (Chapter 2),
- a simplified functional description (Chapter 3) and
- user operating details (Chapter 4).

Other Handbooks

Cintel

Cintel can supply engineering procedure manuals following completion of a Cintel training course. Contact Cintel for further information.

A Python II supplement is supplied with machines integrated with 2K and 4K data capture.

Other Manufacturers

This telecine can be controlled by other manufacturers' remote control systems. For these operating details and/or details of any other equipment or option fitted to your telecine please refer to the relevant manufacturer's documentation.

Options
The following four major options can be added to the C-REALITY telecine:

- Oliver   4K Data   DSX Update (Oliver/HD/HSDL/4K)

- Grace   HSDL

- HD   Audio

Figure 1 – C-REALITY Telecine

Chapter 2 Specification

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Environment
Film Transport and Servo System
Film Scanning System
CVIP (Colour Vector Image Processor)
Digital I/O
Audio System[1]
Supplies
Dimensions and Weight

Cintel policy is one of continuous improvement, and the right is reserved to change specifications at any time without notice.

Environment
Performance will be within the specified limits when the telecine is operated in an ambient temperature between 16°C and 25°C and in a dust-free atmosphere.
Recommended operating temperature range: 18 to 25°C.

Film Transport and Servo System

Gates
2K resolution S35/35mm and S16/16mm interchangeable film gates. Gate apertures designed to encompass maximum camera shooting apertures.

Film Drive
Capstan driven directly by servo-controlled motor. Feed and take-up spooling servos individually controlled to provide constant film tension.

Standards/Systems

Video, Standard Definition
CCIR 601, CCIR 656 (4:4:4 or 4:2:2 SDI)
625 lines, 50Hz, 2:1 interlace
525 lines, 59.94Hz, 2:1 interlace.

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[1] If fitted

(Optional) Video, High Definition
1080i 59.94/60/50 HD Serial Digital, Y.Cr,Cb (SMPTE 292M, 22:11:11), 10 bit
1080i 59.94/60/50 HD Serial Digital, (22:22:22) RGB and Y,Cr,Cb (SMPTE 292M)10 bit
720p   HD Serial Digital (Varispeed to 24fps)
1080P 24sF,   HD Serial Digital (22:11:11 or 22:22:22)
1080P 24,   HD Serial Digital (22:11:11 or 22:22:22)
Switching between HD and other standards is less than 15 seconds

Data, High Resolution
2K data (2048 x 1536) or (2048 x 1556)
(Optional) 4K data (4096 x 3112)

Film Frame Rate

Standard Definition
525, 5-30fps - Precise control of speed in 0.01fps (frames per second) increments.
525, 40-50fps and *(60fps with fpf option)*

625, 5-30fps - Precise control of speed in 0.01fps increments
625, 33-50fps.

(Optional) High Definition
HD Interlace Formats 5-30fps
HD Progressive formats 24/25fps

2K Data
Still-frame, 6fps
HSDL 15fps

(Optional) 4K Data
Still-frame, 0.3 fps

Film Capacity
Core mounted film up to 2,000 feet (approx. 18 inches diameter).
Adapters for film spools.

Fast Running (shuttle)
Continuously variable shuttle in forward and reverse modes with coherent images.

Maximum speed:
10 x normal.

Inching
Single step, forward and reverse.

Stop Mode
Rapid, precise stopping with full specification quality still-frame 'active stop' picture display.

Picture Stability
Better than ±0.05% of film frame height between 5fps and 30fps.

Film Framing (perforation nudge, 35mm only)
Adjustment of framing by ±¼ frames (35mm).
Adjustment of framing by ±½ frames (16mm).

Film Scanning System

Film Gates
All gates fitted with manual focus control.

Light Source
Thick face plate, seven inch, high-intensity cathode ray tube de-mountable from CRT assembly.
CRT assembly incorporates pre-aligned deflection coils and integral magnetic screen.
Negligible x-ray radiation.

Pick-up Devices
Red, green and blue high-resolution solid state sensors.

Digital Scan Control (applicable to 625/525 and 2K. *And Optional, 4K and HD*)
Provides film scanning for:

X, Y Pan and Zoom (area magnification x 0.8 to x 4, limited to x 2 in 2K *and optional 4K)*
Anamorphic unsqueeze (2:1)
Rotate.

Scan Effects (applicable to 625/525 and 2K. *And Optional 4K and HD)*
Scan effects include:

Scan aspects of 4:3 and 16:9
Linear/non-linear X-Y squeeze.

Digital Blanking Control
Output Blanking (not applicable to 2K or *Optional 4K).*
X, Y, size, position and zoom range 0 to 100% of video image.
Appropriate for 4:3 and 16:9 operation.

Beam Current
Switchable:
OFF (CRT switched OFF)
Low 150µA
Normal 300µA.
Tube Saver Mode. (Sets CRT to 150uA and defocusses the scan raster.)

Geometry and Linearity
Any point in the picture is within 0.25% of picture height relative to its true position. Any errors are distributed evenly.

Shading (automatic)

Overall
Less than 1% of signal level with gamma of 0.4 over film density range of 0.0 to 3.3.

Differential
Less than 1% of signal level at gamma of 0.4 over film density range of 0.0 to 3.3.

CRT Correction (automatic)
Includes burn and grain correction, compensates for 3:1 reduction of light output at 300µA.

Resolution without aperture correction

625/525
Not more than 2dB down at 400 lines in the picture centre.
Corner resolution within 1dB of centre resolution at 300 lines. Does not take film losses into account.
(De-rate by 1dB for S16mm).

2K and *optional /HD/4K*
Not more than 3dB down at 800 lines in the picture centre. Corner resolution within 2dB of centre resolution at 600 lines. Does not take film losses into account.

CVIP (Colour Vector Image Processor)

Digital Channel
Full RGB Primary and multi-vector Secondary correction.
Variable saturation 0 to 200%.

Enhancement (digital)
Individually adjustable red, green and blue aperture correction.
0 to +12dB maximum horizontal and vertical.
0 to -12dB negative enhancement (softening) included.

Signal-to-Noise Ratios (at gamma 0.4)
Measured with N.D. 1 in the vision gate, the ratio being 700mV divided by r.m.s. noise voltage.

625/525
Red: Better than 55dB.
Green: Better than 60dB.
Blue: Better than 55dB.

Optional HD
Red: Better than 50dB.
Green: Better than 50dB.
Blue: Better than 50dB.

2K
Red: Better than 55dB.
Green: Better than 55dB.
Blue: Better than 55dB.

Optional 4K Data
To be advised

Masking
Choice of pre-set masking equations for several film stocks and user programmable masking equations for special work.

Pre-set masking for Kodak film materials are:

Colour Print
Vision & Primetime negative
Inter positive (5244 & 7244).

Digital I/0

SD
Inputs
CCIR 601/656 Serial links 4:4:4 or 4:2:2 external reference.
Mixed sync 2V to 4V or composite video, negative going.

Output
CCIR 601/656 Serial links 4:4:4 or 4:2:2 (Clean and reference wipe outputs).

Optional HD
Inputs
Tri-Level sync

Output
SMPTE -292M Serial link 22:22:22 or 22:11:11 aka "4:4:4" or "4:2:2"

Data
2K/*Optional 4K*   LVDS multi-pin connection for coupling to Cintel Python II
(With HD option only) 2K only HSDL via HD "4:4:4" serial outputs

Optional Audio System[2]

Audio Sources
35mm COMOPT Dolby A & SR stereo, 16mm COMOPT.
External stereo inputs.
Internal tone generator.

Frequency Response
Optical 16mm: 50Hz to 7kHz, ±2dB.
Optical 35mm: 50Hz to 8kHz, ±2dB.

Signal-to-Noise UNweighted

Optical
Better than 55dB.

Audio Delay
0 to 1.3 seconds.

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[2] If fitted

Supplies

Local Supply	Current Rating
194-257V, 50Hz	20A
97-129V, 50/60Hz	40A

Dimensions and Weight

Width: 1620mm
Height: 1790mm
Depth: 905mm
Weight: 850Kg (net).

Chapter 3 - General Description

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Colour Processing System
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Introduction

C-REALITY is a multi-standard telecine and data scanner that combines the advantages of digital flying-spot scanning techniques with the very latest technology, to produce images of uncompromised quality regardless of the selected operating standard.

The telecine is available in a number of configurations to support 525, 625 and high definition television standards plus true 2K and 4K data output.

The telecine can be divided into five major functional systems as shown in Figure 1.

(See Oliver and Grace Supplements for full description of these optional features)
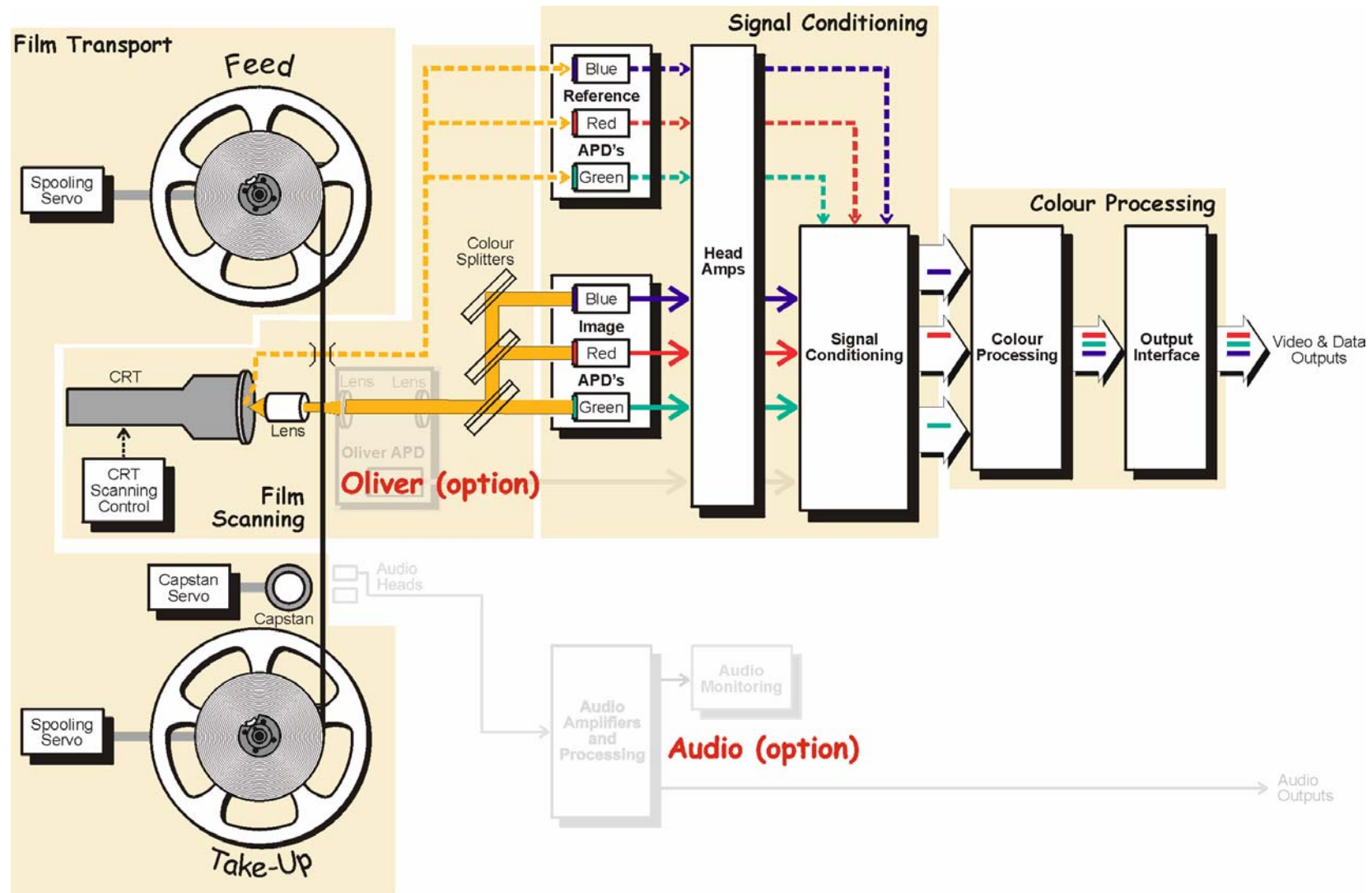
Figure 1 – Top Level Block Diagram

The Film Transport System precisely controls film position. Information derived from the film by the Film Scanning System is converted into electrical signals. These signals are subsequently digitised and conditioned by the Signal Conditioning System and then processed by the Colour Processing System. The Colour Processing System provides picture output to the selected standard. The film soundtrack is picked up by the Audio System[1] to provide the audio output.

Although designed to be operated from a remote control desk C-REALITY can also be controlled and configured locally where much of the desk's functionality is replicated.

Film Transport System
The Film Transport System is digitally controlled and achieves near-pin registration stability without the need for mechanical pin registration. It transfers film at a constant rate on a series of guide rollers from the feed core, through the vision gate, past the audio head (if fitted) and onto the take-up core. See Figure 2. The film is scanned by a raster from the CRT as it moves across the vision gate.
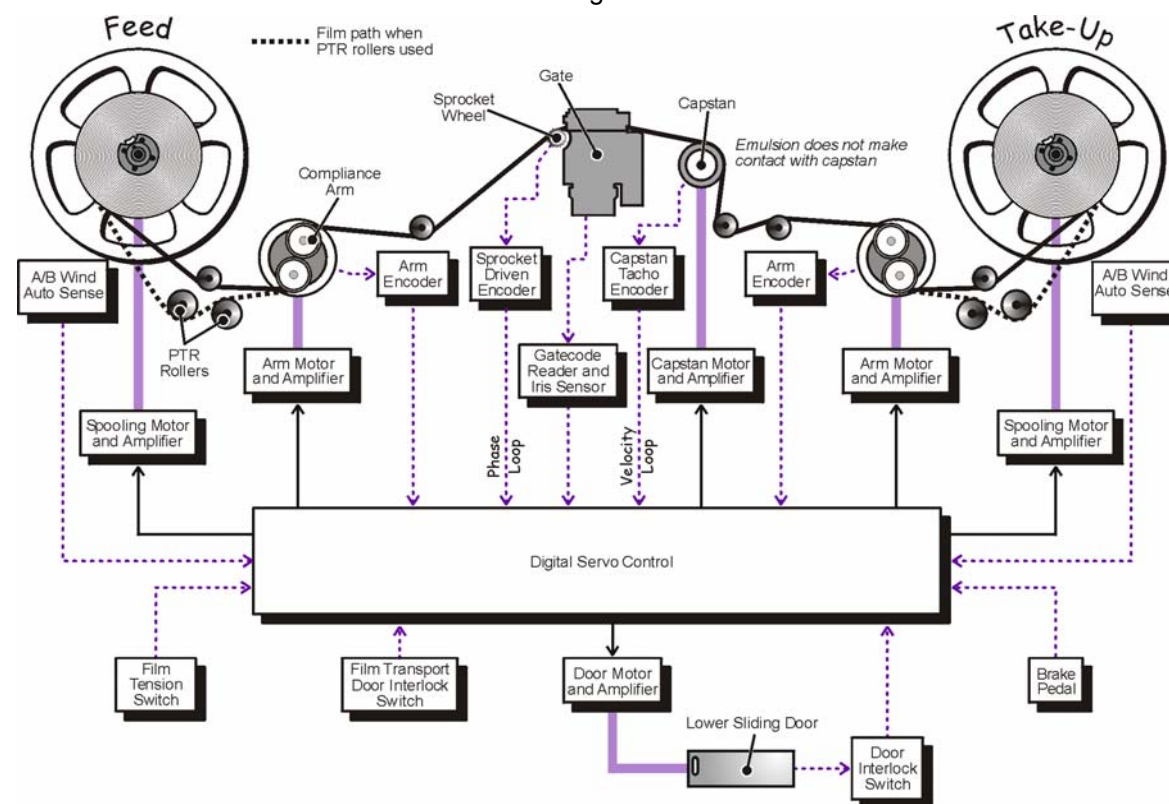
Figure 2 - Film Transport System Block Diagram

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[1] Option

All transport mechanism components are mounted on the deck plate located behind the film transport door. This door and the lower motorised door are safety-interlocked to force the telecine into a STOP condition when either of these doors is opened.

A servo-controlled sprocket-free capstan drive ensures that film velocity is constant and film handling is gentle. Capstan stability is maintained by feedback of velocity information from an optical tachometer encoder on the capstan shaft.

A capstan phasing loop ensures correct picture framing by comparing pulses from the sprocket-driven encoder with station syncs. If framing is incorrect an error signal is produced; this signal is used to modify the capstan velocity to restore correct framing. When the transport is stopped the film is positioned in the vision gate to give a correctly framed picture. In this 'active stop' condition the capstan and spooling servos are enabled but stationary.

The film feed and take-up cores are individually driven by separate servo-controlled D.C. motors. This reduces the effect of load variations on the capstan by maintaining the correct film tension. The speeds of the spooling motors are controlled by signals generated by encoders on compliance arms located on either side of the vision gate. In the absence of film the encoder outputs inhibit transport operation. A or B winds are automatically sensed.

The film transport system provides film motion in both forward or reverse directions in 0.01fps increments up to 30fps (525, SD), 30fps (HD option) and various speeds in data mode to a maximum of 6fps or (15fps with HSDL option in 2K) and 0.3fps in 4K option. Film can be shuttled in forward and reverse directions at up to 10 x normal speed in all modes of operation. The mechanism accommodates 16/S16mm and 35/S35mm film formats (1, 2, 3 perforation and 4 perforation) with simple substitution of the vision gate to change from 16/S16[2] to 35/S35. Normal, wide screen and anamorphic film is accepted.

Film cores are driven through rubber pads and conversion from one gauge to another requires only the addition or removal of spacers. Film run tension is adjustable to accommodate valuable archive material. PTR (Particle Transfer Rollers) rollers are included as standard on the deck plate for film cleaning purposes. The PTRs are optional in the film lacing path.

Film Scanning System (See Oliver Supplement for description of optional Oliver feature)
The Film Scanning System scans the moving film as it passes through the vision gate. The modulated light produced by the different film image densities is then separated into its red, green and blue constituent colours. The light is then converted into electrical signals by (A)valanche (P)hoto (D)iodes. The system consists of a digitally scanned high quality thick faceplate CRT and a simple optical arrangement with colour splitters and filters as shown in Figure 3. Using this system image resolution is only limited by the optical path and the CRT spot size.

Light from the raster produced by the CRT is focused onto the film by an objective lens. A condenser lens behind the film then collects the transmitted light. Using a series of dichroic mirrors and filters, the red, green and blue components are separated and converted into electrical signals by three separate APD's.

While these APD's are used to create the image three additional devices, the reference APD's, are used to form an active compensation system. This system monitors the CRT face and generates signals that are used to remove all shading and fixed-pattern phosphor irregularities. Light is carried by fibre optic cables from the CRT face to the reference detectors. This system coupled together with a straight light path provides excellent signal to noise ratios and pure colorimetry at all resolutions.

The mirrors, filters and APD's are housed in an enclosed cell box to eliminate the effects of external light interference; the interchangeable condenser lenses fitted onto the gate and towards the rear of Oliver are also shielded from interference by light traps. The gate light trap is user removable to assist in film lacing.

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[2] The 16mm and 35mm gates have adjustable format masks to cover the sound track area on 16 and 35mm material.

Scanning Effects

All scanning effects are "optical"; that is, all effects are achieved by manipulating the scan. This avoids the resolution limitations experienced when processing a digital representation of the image.

Scanning effects include zoom, rotation, linear and non-linear X-Y squeeze as well as many other more advanced effects. Provision is made for reproducing wide-screen or anamorphic film at any desired film and/or TV aspect ratio. Refer to the relevant control system literature for further information.
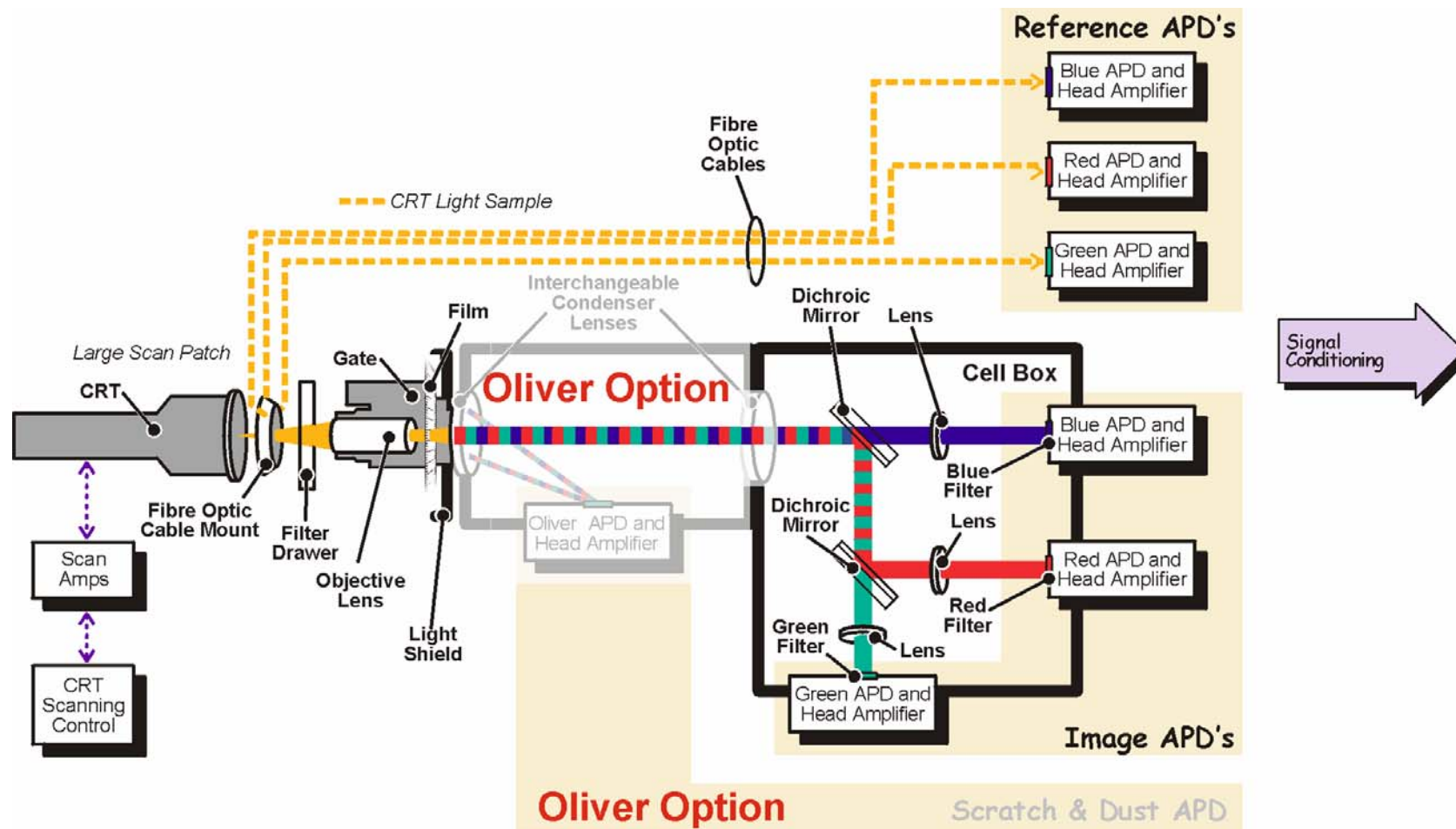

Figure 3 - Film Scanning System Block Diagram

Signal Conditioning System

The Signal Conditioning System accepts the modulated red, green, signals from the image APD's, converts the signals to digital and applies correction in readiness for colour processing as shown in Figure 4.
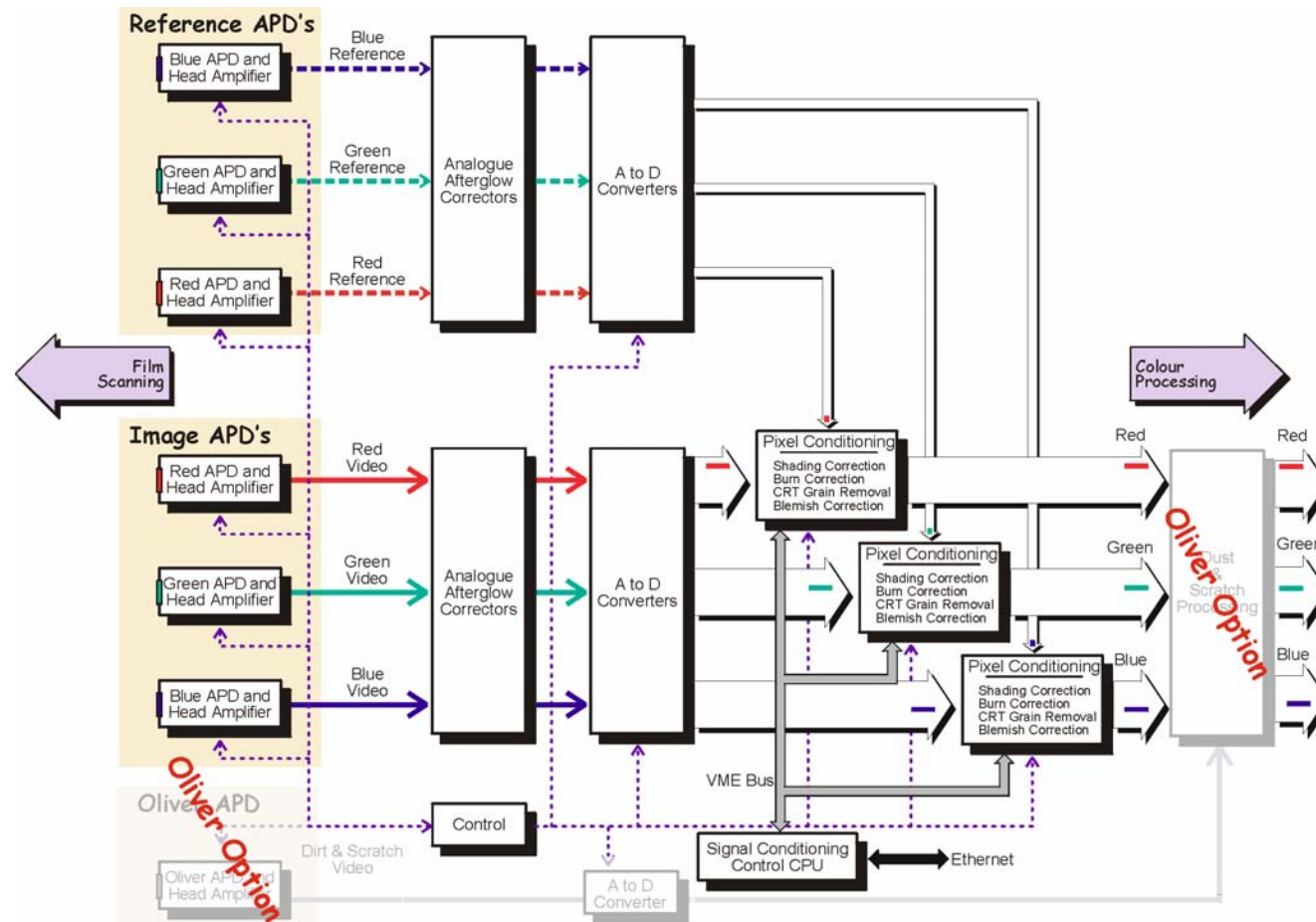
Figure 4 – Signal Conditioning System Block Diagram

Light falling on all six APD's produces current signals that are converted into voltage signals by the head amplifiers. Afterglow correction is then applied before being converted into 14-bit digital signals by A to D converters.

The digitised signals generated from the reference APD's are used to apply *pixel conditioning* to the signals produced from the image APD's. Shading correction, burn correction, grain removal and blemish correction is all applied before the three separate red, green and blue colour channel signals are subjected to colour processing.

Colour Processing System

The Colour Processing System accepts the colour channel outputs from the Signal Conditioning System and outputs pictures to the selected standard and configuration. See Figure 5.
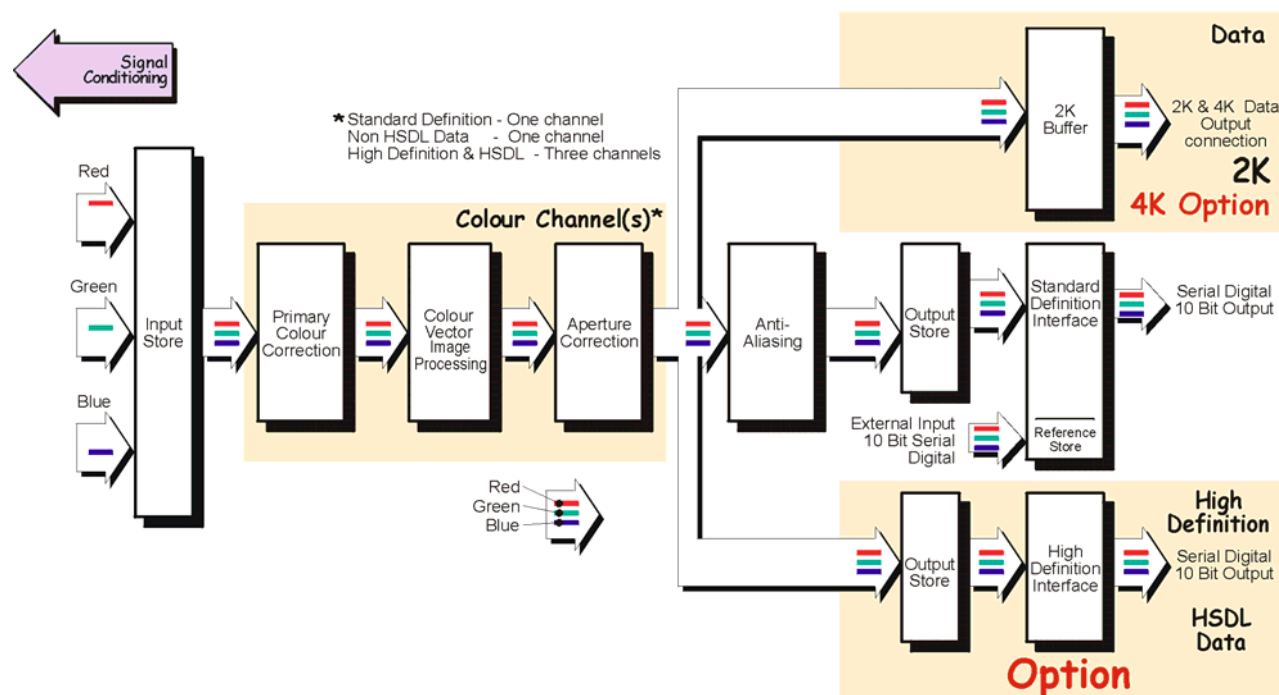
Figure 5 – Colour Processing System Block Diagram

The incoming colour channel signals are passed to the input store and then onto the primary colour corrector. If configured for optional High Definition operation, the input store splits the incoming signal into three separate signals representing the upper, middle and lower thirds of the image for delivery to three separate colour channels.

The primary colour corrector applies lift, gamma and gain adjustments by means of look-up tables and also applies signal inversion for negative film.

The colour vector image processor performs hue, saturation and luminance operations on the signals before being passed to the aperture corrector. The output from the aperture corrector feeds the anti-aliaser and then the output store.

The output store uses three framestores to provide the interlacing necessary for 525/625 operation and 3:2 field sequencing. It also recombines the segmented colour channel signals on optional High Definition configured machines.

The signal from the output store feeds into the output stages. The SD output stages contain a reference frame that takes its input either from the output store or from an external digital input. This frame can be combined with the current output to provide a comparison of picture quality and content. The signals from the output stage/s are available at the termination panels on the rear of the machine.

Audio System[3] (Optional)

The Audio System picks up the film soundtrack and amplifies it to provide the audio output. See Figure 6. The system is able to introduce a delay of up to 1.3 seconds into the output and accommodates 16mm optical, and 35mm optical mono and stereo sound.
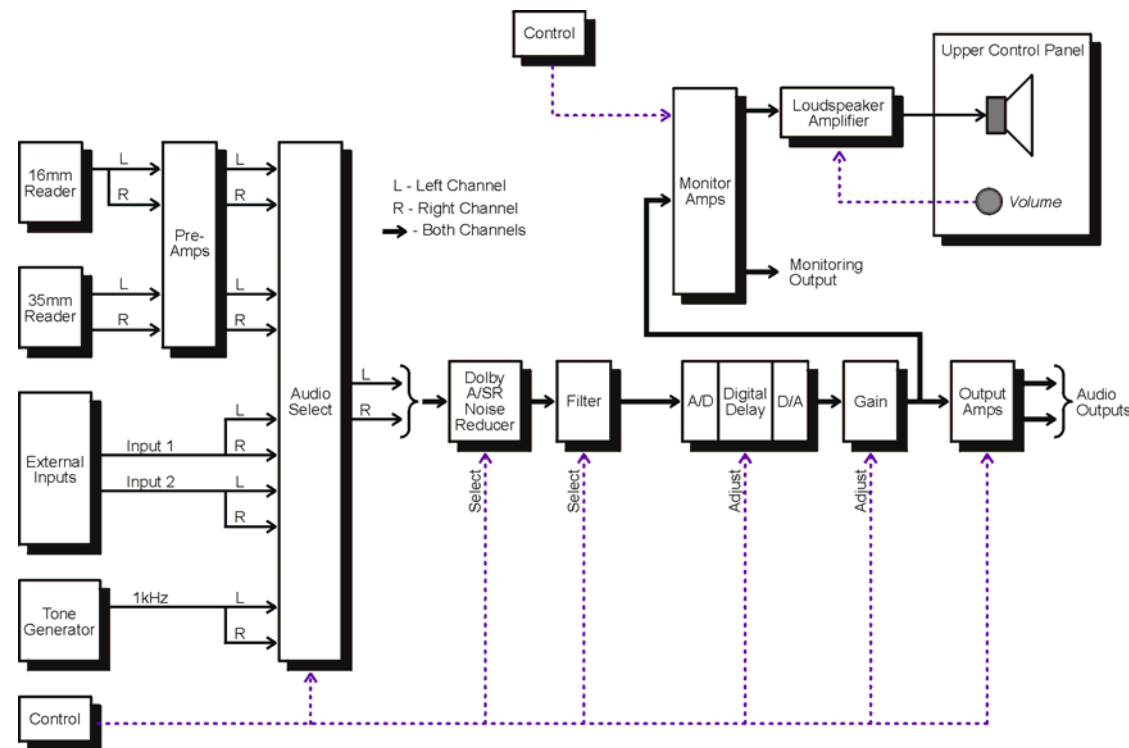
Figure 6 - Audio System Block Diagram

Audio signals from the selected source, an optical sound head reader or an external input, are passed through a Dolby noise reducer and then filtered accordingly to limit the bandwidth. The signals are then digitised, subjected to a user definable digital delay of up to 1.3 seconds, converted back to analogue and adjusted for gain before being distributed to output and monitoring amplifiers.

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[3] Audio capability is an option

The digital delay is incorporated to compensate for the relative positions of the vision gate and audio reader. It also allows for delays introduced by downstream processing on the video path.

An internally generated test tone (1kHz) is provided to test the audio path.

Audio Monitoring
Audio signals are monitored by the loudspeaker situated in the upper control panel and level is adjusted with the adjacent control. When stereo is selected left and right channels are combined to produce a single monaural drive. Audio can also be monitored from the rear of the machine on Termination Panel 2. These outputs can be configured for left/right or sum & diff. monitoring.

Control
C-REALITY is designed to be operated remotely from a remote control desk that provides full control over all facilities. The desk, essential for full telecine operation, communicates with the telecine through an Ethernet connection. A limited amount of control is however provided at the telecine. Refer to manufacturer's literature for separate control desk operation.

Local Controls
Local controls are generally located on one of two control panels on the front of the machine and allow the operator to lace film and perform all basic machine functions.

Details of all local controls and the most common operating procedures can be found in Chapter 4.
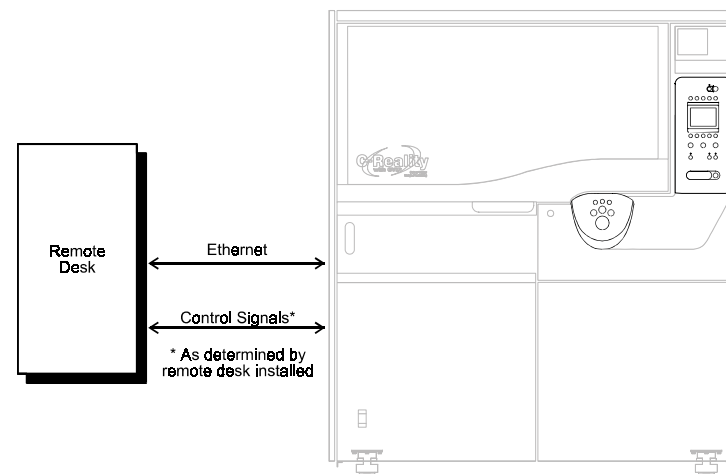
Figure 7 Control System Block Diagram

Chapter 4 - Operating Information

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General Information

Operating Procedures

⚠️**Warnings**

Electrical supplies in excess of 50 (fifty) volts are potentially hazardous or lethal; supplies of up to 30kV exist within the C-REALITY Telecine. THE TELECINE MUST ONLY BE OPERATED WITH ALL COVERS IN PLACE; covers and access doors that are secured with key operated locks must only be removed by qualified service personnel for maintenance purposes.

⚠️**The Telecine is designed so that it CANNOT be operated with either the film transport or lower sliding doors open; safety interlock switches force the Telecine into a STOP condition when either of these doors are opened. Do NOT in any way over-ride, modify or alter the operation of these switches; these switches are fitted for safety purposes and can only be over-ridden by a qualified engineer equipped with the correct service tool.**

⚠️**Ensure that film tension is switched OFF (film tension push-button extinguished) BEFORE touching any part of the film transport mechanism.**

GENERAL

Although designed to be operated from a remote control desk C-REALITY can also be controlled and configured from the Local Control Panel where much of the desk's functionality is replicated.

This chapter discusses C-REALITY functionality only; remote control desk operation (through an Ethernet link) is NOT discussed. Refer to the relevant manufacturer's documentation for control desk details.

This chapter is divided into two parts:

(i)   A reference section. This section explains the function of the controls at the Telecine and illustrates the menus available on the hierarchical control system that is accessible from the local control panel. Some options and settings NOT covered by the procedures' section are explained in this section. Other options are covered by separate supplements.

⚠️**Caution**

The hierarchical menu control system offers access to some functionality that is intended for engineering purposes only.

(ii)   A procedures' section. This section guides the user step-by-step through the most common operations.

Storage

When not in use C-REALITY should be left with both doors CLOSED. This helps to prevent dust and similar small particles from contaminating the deck plate area. Film should NOT be left laced when not in use as doing so may cause permanent film distortion.

Handling of Film Material

It is recommended that normal in-house procedures for handling original film material be observed.

Time-Limited Trial Software

This Telecine is configured in the factory to function with the software options purchased at the time of sale. These options are documented in a licence file on the configuration disk that contains:

• a description of each fitted option,
• a Key (or encrypted ASCII string) that permits use of the option and
• an indication of the duration of the option (or key).

Options fitted to your Telecine (and expired options) are displayed on the Telecine Options Menu.

Key Duration and Usage
There are three key types:

Lifetime Key
Options purchased at the time of sale are normally enabled for use with a lifetime key.

7-Day. Time-Limited Trial Key
This key is designed to enable Cintel engineers to temporarily restore full functionality to the Telecine following a service call. This key will then be replaced by an appropriate key issued directly by Cintel. A 7-day key can only be issued once for any given option.

28-Day. Time-Limited Trial Key
This key is designed to enable the use of an option that is in the process of being purchased. When purchased this key will then be replaced by a lifetime key issued directly by Cintel.

56-Day. Time –Limited Trial Key
This key is designed to enable the use of an option that is in the process of being purchased. When purchased this key will then be replaced by a lifetime key issued directly by Cintel.

366-Day. Main Software Key. This key is issued annually and is supplied based on the terms of the license issued at the time of purchase.

CONTROL REFERENCE

This reference section explains the functions of the controls available at the Telecine. Controls are located on the upper and lower control panels and on the deck plate as shown in Figure 96.

Figure 1 Location of Controls

Power ON/OFF Switch

⚠️**Warning**

The power ON/OFF switch on the Telecine does NOT switch power ON/OFF to the remote control desk. Refer to relevant manufacturer's documentation for details.
The power ON/OFF switch is located at the front of the machine on the lower left-hand side. Move the switch up into the **|** position to switch power ON, move the switch down into the **O** position to switch power OFF. Ensure that the Telecine is shutdown correctly (as described in Procedure 8) BEFORE the power is switched OFF.

⚠️**Caution**

Failure to observe the correct shutdown procedure may corrupt the internal hard drive.
C-REALITY recognizes an incorrect shutdown sequence, and at next power up will, on the local display panel, advise there had been an incorrect shutdown sequence. The C-REALITY will then automatically check and automatically "rebuild" the hard disk contents

Defaults After Initialisation
When switched ON and following initialisation the following defaults apply:
- CRT heaters OFF, CRT available.
- EHT is OFF.
- Local control is selected; *LOCAL* LED is illuminated.
- Display shows Top Level Menu.
- PEC and shading boards are NOT aligned.
- Film tension is OFF.
- Mechanism is in Stop condition.
- Film standard is determined by vision gate selection.
- Film format determined by setting at previous power-down.
- Film Type will revert to Negative
- Aperture correction is turned OFF.
- Audio output is OFF (if option is fitted).
- Some functions available via local display menu system adopt default settings.

Lower Sliding Door Switch *(DOOR)*

(DOOR)

Press *DOOR* to open/close the lower sliding (adjacent) door. If desired the door can be operated manually with the handle. This door gives access to the CRT location and the CRT face filter drawers and mount adaptors. The door also gives access for the adjustment of gate aperture, gate focus. The door will open automatically if the film transport door is opened.

Note: Your Telecine can be configured so that the door will not automatically close if the film transport door is closed. Refer to Cintel Customer Support department for details.

Note: The sliding door switch will be disabled by the safety interlock system if a Stop command has NOT been issued. If the door switch fails to operate first press STOP.

Lower Control Panel

The Lower Control Panel, located just below and to the right of the Film Transport Door, provides the Telecine's film transport controls as shown in Figure 2.
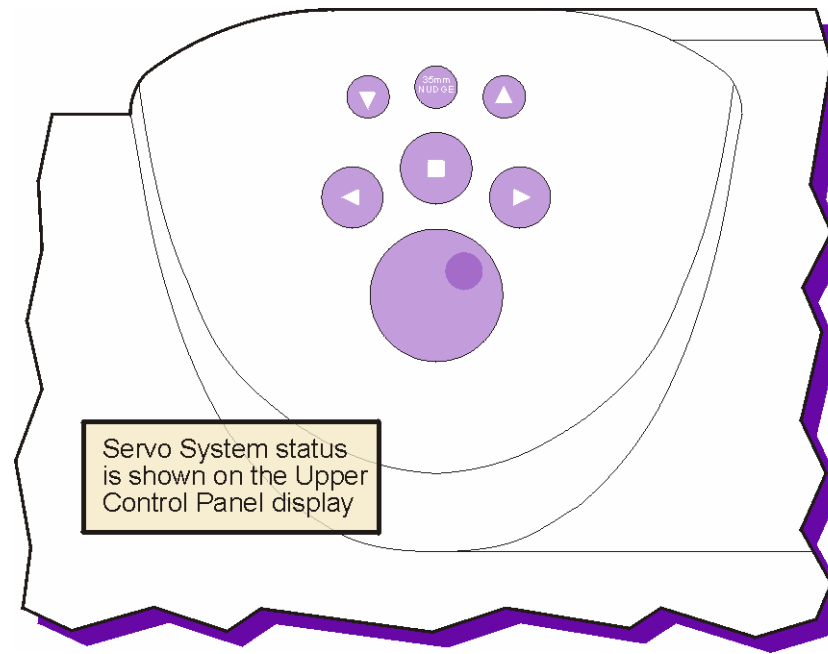
Figure 2 Lower Control Panel

Press STOP to instantly stop film motion in either direction and at any speed. This control remains available under remote control.

Press RUN/SHUTTLE FORWARD to initiate film movement from the feed core to the take-up core as follows:

- Press once to transport film at selected run forward frame rate.
- Press twice to transport film at selected shuttle forward frame rate. Maximum shuttle speed equates to 250 frames per second (fps) for 35mm and 500fps for 16mm.

Run forward and shuttle forward frame rates are pre-determined either at the remote control desk (see manufacturer's documentation) or at the local control panel (see Transport Configuration Menu).

Auto-Stop

Auto-Stop protects film from winding off the core by automatically stopping the film transport system when either end of the film is approaching. This feature is selected from the Transport Configuration Menu.

Press RUN/SHUTTLE REVERSE to initiate film movement from the take-up core to the feed core. This control operates in a similar manner to RUN/SHUTTLE FORWARD.

Press 35mm NUDGE to frame the Telecine picture by nudging the film (in the forward direction) in one perforation (or ¼ frame for 4 perf material) increments. This ensures that the film can be correctly framed (to ¼ frame accuracy with 4 perf material) without having to re-position the film on the sprocket. Operates in 35mm mode only. (Nudges 3 perf material 1/3 frame, 2 perf material ½ frame)

Press FRAME UP or FRAME DOWN to accurately frame the Telecine picture when film is in motion. To frame the picture when in Stop set the user framing default from the Transport Configuration Menu.
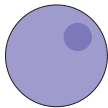
Press and/or rotate the JOG/SHUTTLE WHEEL as follows:

To Select Operating Mode. Press to select the Jog or Shuttle mode. The currently selected mode is shown on the upper control panel display Top Level Menu.

When in Shuttle Mode.
- Press to stop film transport (if running) and select Jog mode.
- Rotate to vary shuttle speed in small steps up to the maximum in either direction.

When in Jog Mode.
- Press to select Shuttle mode.
- Rotate to move one frame at a time in either direction.

Upper Control Panel

The Upper Control Panel (shown in Figure 3) located to the right-hand side of the Film Transport Door provides access to many local control facilities primarily through the use of a hierarchical menu control system. The menus are displayed on an Electroluminescent (EL) display and are navigated/selected with the adjacent *soft* controls. The panel also includes a number of dedicated controls.   Behind this control panel are located the CDROM and floppy disk drives for System Software and Firmware respectively.

Display with
Soft Controls:

Typical Display Layout 5
Menu Hierarchy 6
Menus 7-95

Loudspeaker with
Volume Control
(for monitoring)*

* If audio option fitted
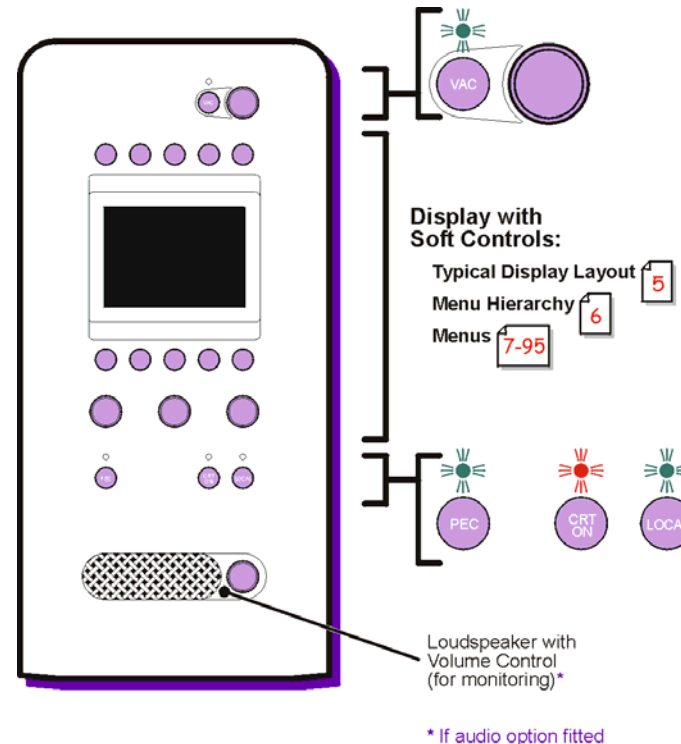
Figure 3 Upper Control Panel

Dedicated Controls

Press VAC to apply aperture correction to the colour channel output. The amount of correction is set by the adjacent digipot. The LED is illuminated when this mode is selected.

The VAC control is only available when the display menu is at the TOP level

Press PEC to display the PEC Control Menu (see Figure 9) on the adjacent display and allocate control of signal detector PEC levels to the three digipots **1**, **2**, **3** (identified in Figure 5. This control is disabled when PEC level adjustment is inappropriate, for example, when the Auto Alignment Menu is selected. The adjacent LED is illuminated when this mode is selected.

Note: The PEC control gives easy access to the PEC Control Menu that is embedded within the hierarchical menu control system.

Press CRT ON to initiate the CRT heater warm-up period. This takes approximately 30 seconds. The CRT heater must be on and warmed-up before EHT becomes available. If the CRT is switched off when the EHT is on, the EHT is automatically switched off. The warm-up sequence is illustrated in Figure 4. This control remains available under remote control.

Note: The CRT heater is subjected to a timeout and will switch off automatically if the EHT is off for more than 30 minutes.
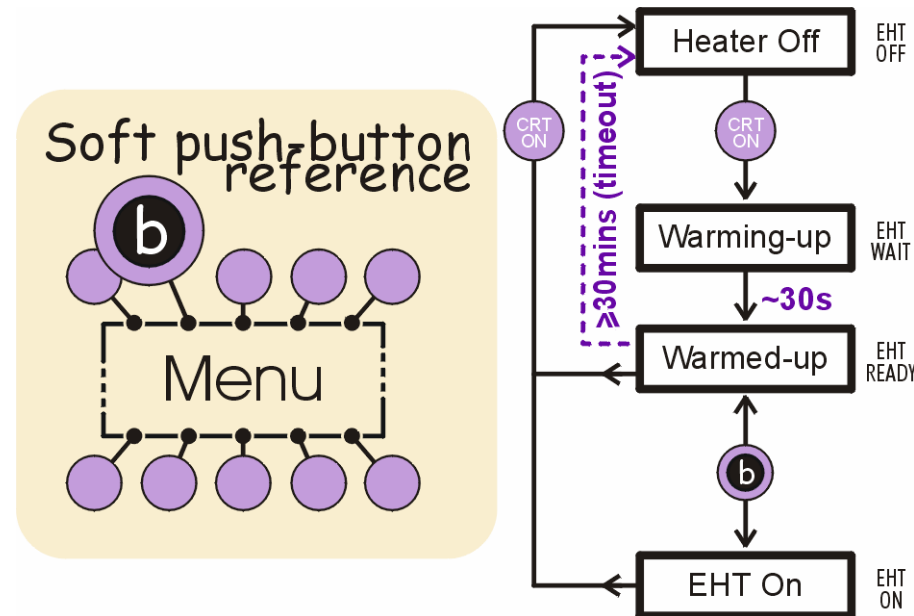
Figure 4 CRT Heater Warm-up/EHT Availability Sequence

Press LOCAL to select either local control at the Telecine or remote control from the remote control desk. The adjacent LED indicates the current selection:

- LED illuminated - local control.
- LED extinguished - remote control.

Pressing LOCAL will change the availability status of functions on the Telecine; when remote control is selected all functions with the exception of CRT ON and STOP are no longer available.

Loudspeaker Volume[1]
Determines the audio monitoring volume level of the adjacent loudspeaker.

---

[1] If audio option fitted

Display Overview

The typical layout of the display is shown in Figure 5

Figure 5 Typical Display Layout

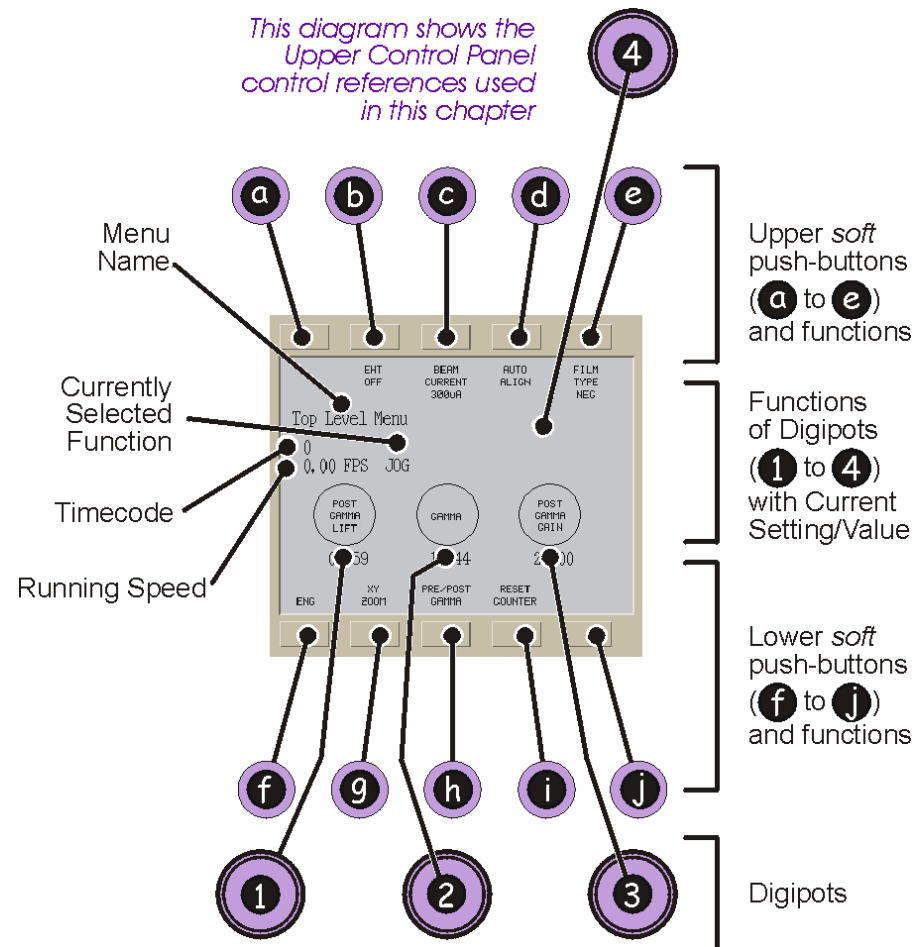Two rows of push-buttons, one located above the display (ⓐ to ⓔ) and one below (ⓕ to ⓙ) provide access to further menus and functions. Four digipots (❶ to ❹) allow for adjustment of parameters as indicated on the display.

Screen-Saver

Following a period of approximately ten minutes of local control panel inactivity the display screen-saver will be activated and the soft push-buttons disabled. All other local controls remain available. On the next button press (or rotation of a digipot) the screen-saver will be switched off and the soft push-buttons re-enabled. This set-up determines that functions available on the soft push-buttons are only accessible when the screen-saver is OFF.

Note: The screen-saver displays the machine serial number and customer name, alternative screen saver text can be set in the CONFIG.TXT file. Refer to Cintel Customer Support department for details.

Menu Navigation and Functionality

The menus are navigated with the soft push-buttons. By default the Top Level Menu is displayed. From this menu all other menus can be accessed. The menu hierarchy is shown in Figure 6 and the further menus are shown in Figures 7 to 95, these figures summarise the functionality provided by the menus.
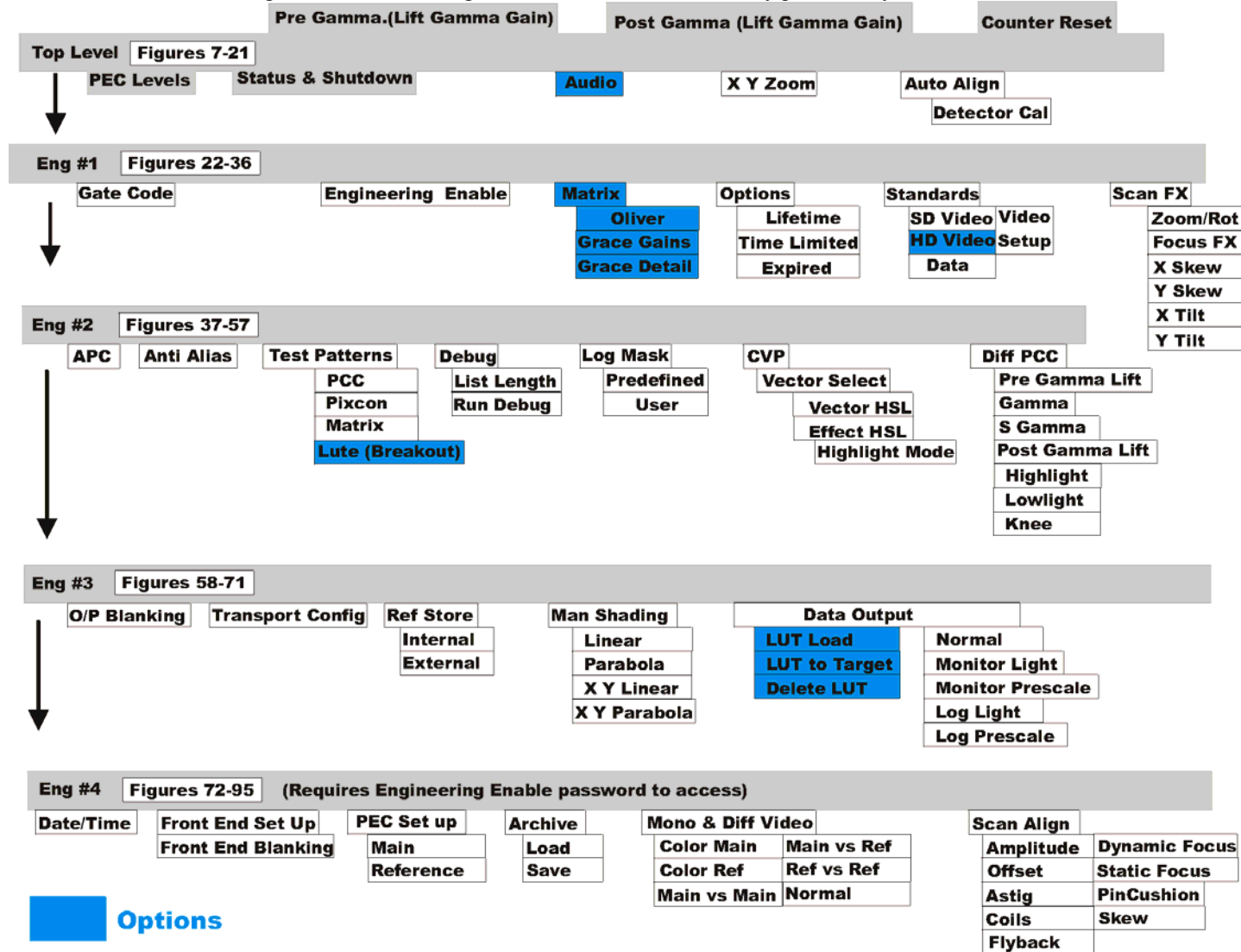

Figure 6 Menu Hierarchy

Some of the menus below are interactive. Right click over the buttons with red circles to move around the menus. Buttons without red circles have a single function or their function is cyclical selection, in which case the button has the cyclic list marked adjacent to it.
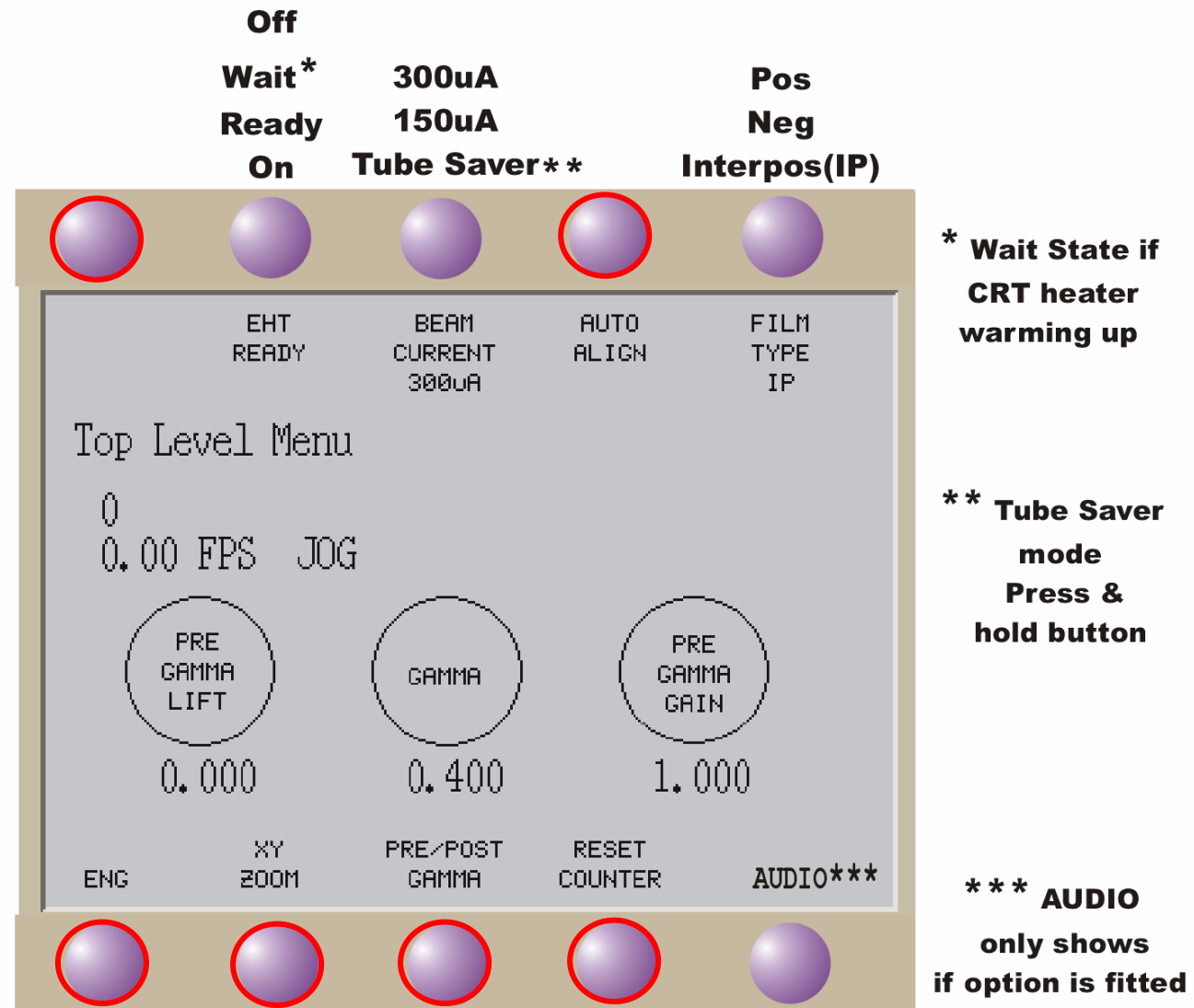
Figure 7 Top Level Menu (Pre Gamma)

Off

Wait*   300uA   Pos

Ready   150uA   Neg

On   Tube Saver **   Interpos(IP)

* Wait State if
  CRT heater
  warming up

EHT   BEAM   AUTO   FILM
OFF   CURRENT   ALIGN   TYPE
                 300uA   NEG

Top Level Menu

0
0.00 FPS   JOG

** Tube Saver
   mode
   Press &
   hold button

POST   POST
GAMMA   GAMMA   GAMMA
LIFT   GAIN

0.059   1.344   2.000

ENG   XY   PRE/POST   RESET   AUDIO***
       ZOOM   GAMMA   COUNTER

*** AUDIO
    only shows
if option is fitted
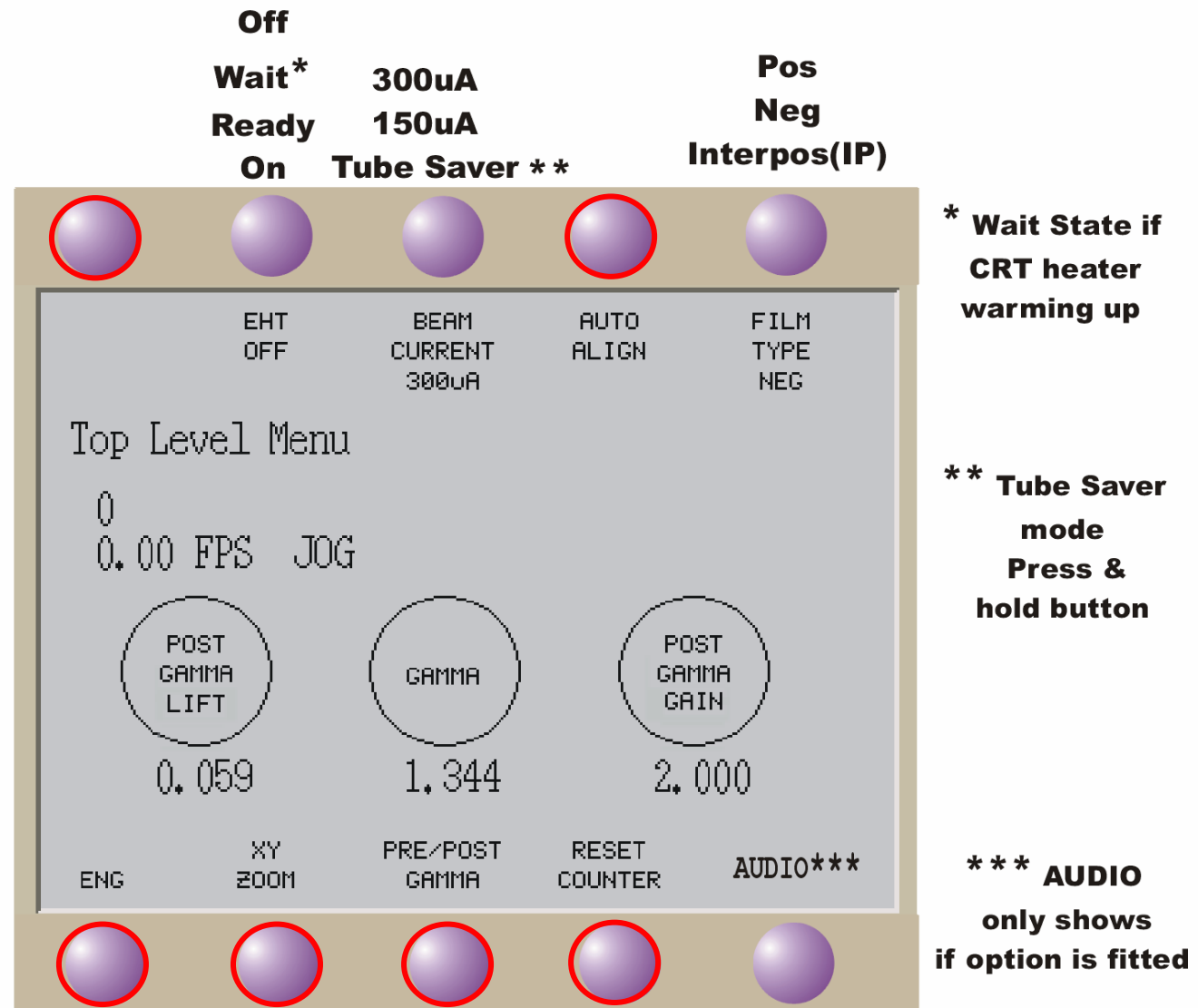
Figure 8 Top Level Menu (Post Gamma)

Off

Wait

Ready

On
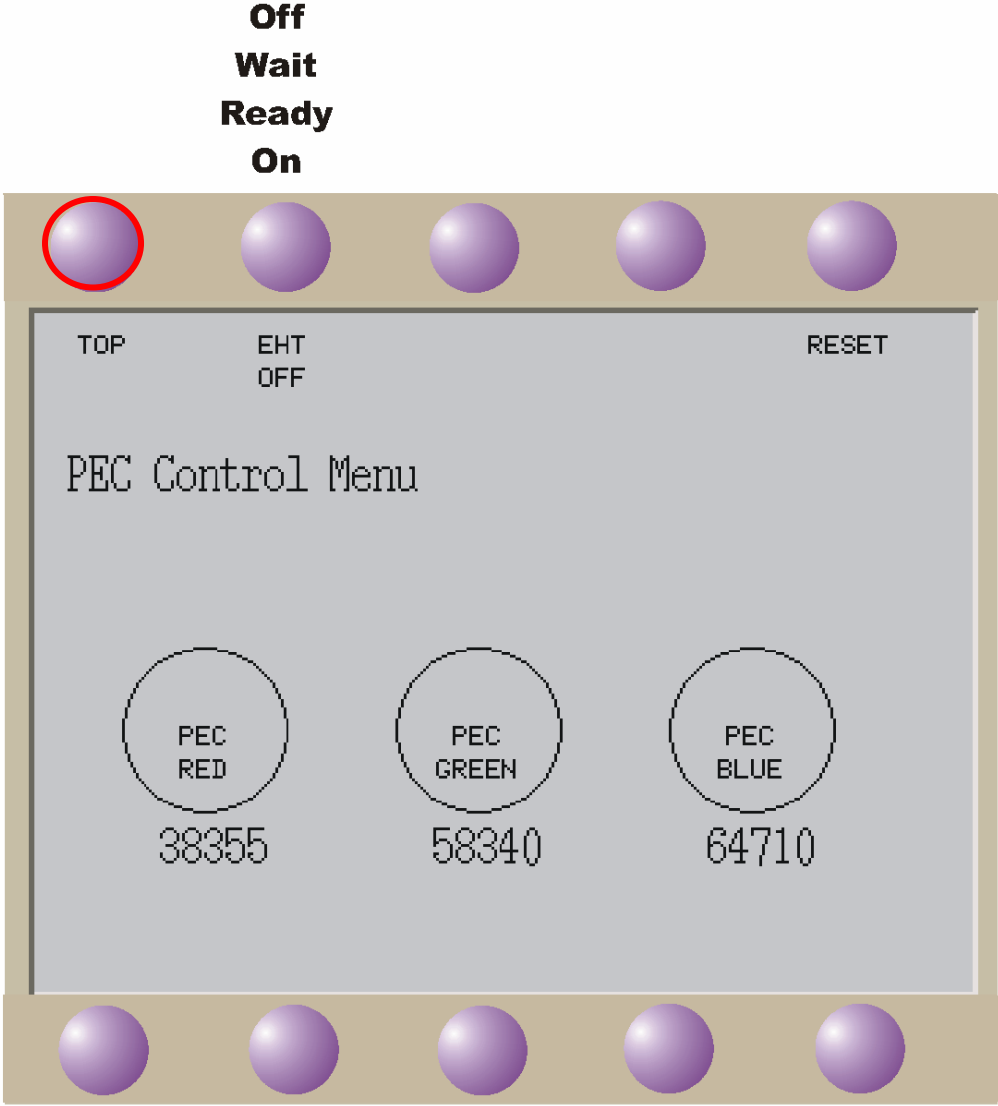
Fig 9 PEC Levels
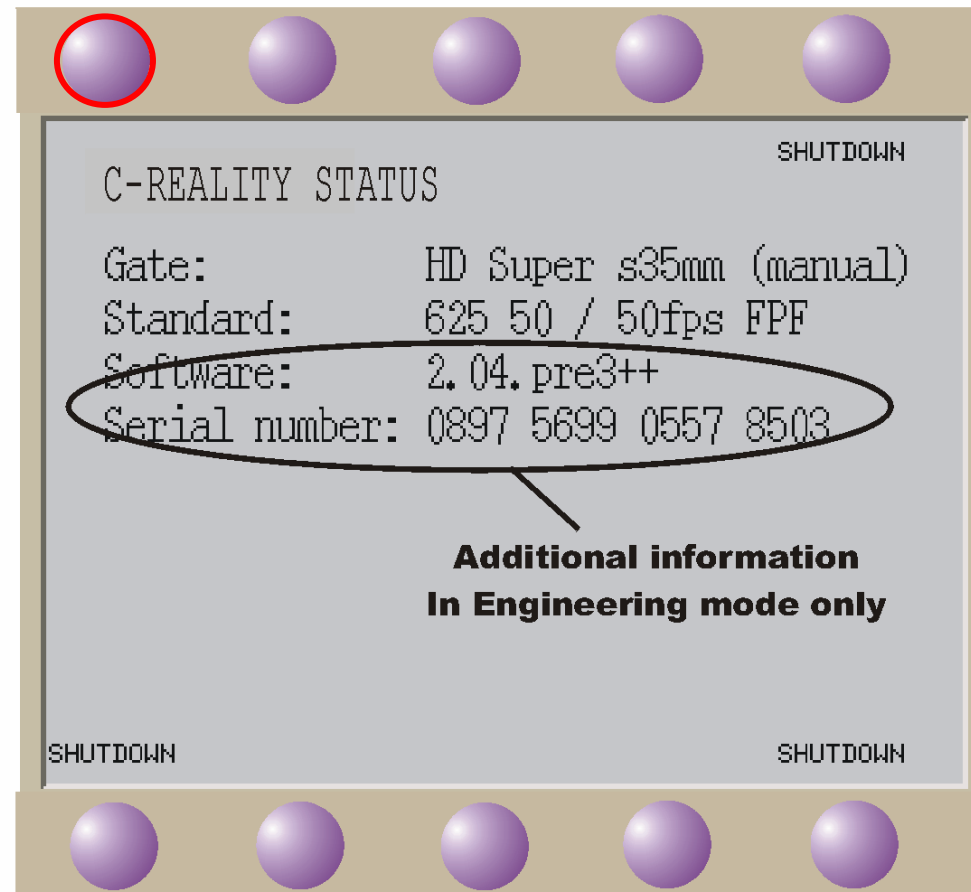
Figure 10 Status and Shutdown Pages

None
EXT1
EXT2
Test Tone   EXT1 Off/On   On   Flat
Film   EXT2 Off/On   Off   5Khz
                                         8Khz
                                         Academy

TOP   AUDIO SOURCE   EXT1 ON   DIGITAL   FILTER
       FILM   EXT2 OFF   OFF   FLAT

Audio Menu

Option

REMOTE   AUDIO
GAIN   DELAY

80   10

DOLBY   STEREO   SPEAKER   METER   LAMP
SR   ON   MONO   BOTH   ON

SR   On   Mono   Both   On
A   Off   Left   Sum&Diff   Off
Off   Right

Fig 11 Audio Menu

Off

Wait

Ready

On

TOP   EHT   RESET
          READY

X/Y Zoom

Pan / Zoom

X
PAN

Y
PAN

ZOOM

0   0   1.00

Figure 12 X Y Zoom

**Engineering
Mode
only**

CANCEL

DETECTOR
CALIBRATE

DETECTOR CALIBRATION OUT OF DATE ← **If more than 30 days
since Calibration**

Ensure hold-down is engaged

**Engineering
Mode
only
(Normal Align
is at 300uA)**

SHADING
ALIGN AT
150uA

SHADING
ALIGN

MAIN
SIGNAL
(log)

Video Output
Main Signal (Log)
Main Sig (Lin)
Shading Mode (Full)
Ref Correct Only
Map Correct Only
Ref Signal (Log)
Ref Signal (Lin)
Shading Map
Shading Trim
Ref Signal (Inverted)

**300uA
150uA**

Fig 13 Auto Align Menu

Performing shading alignment
at (150 or 300uA)
0 %

ABORT
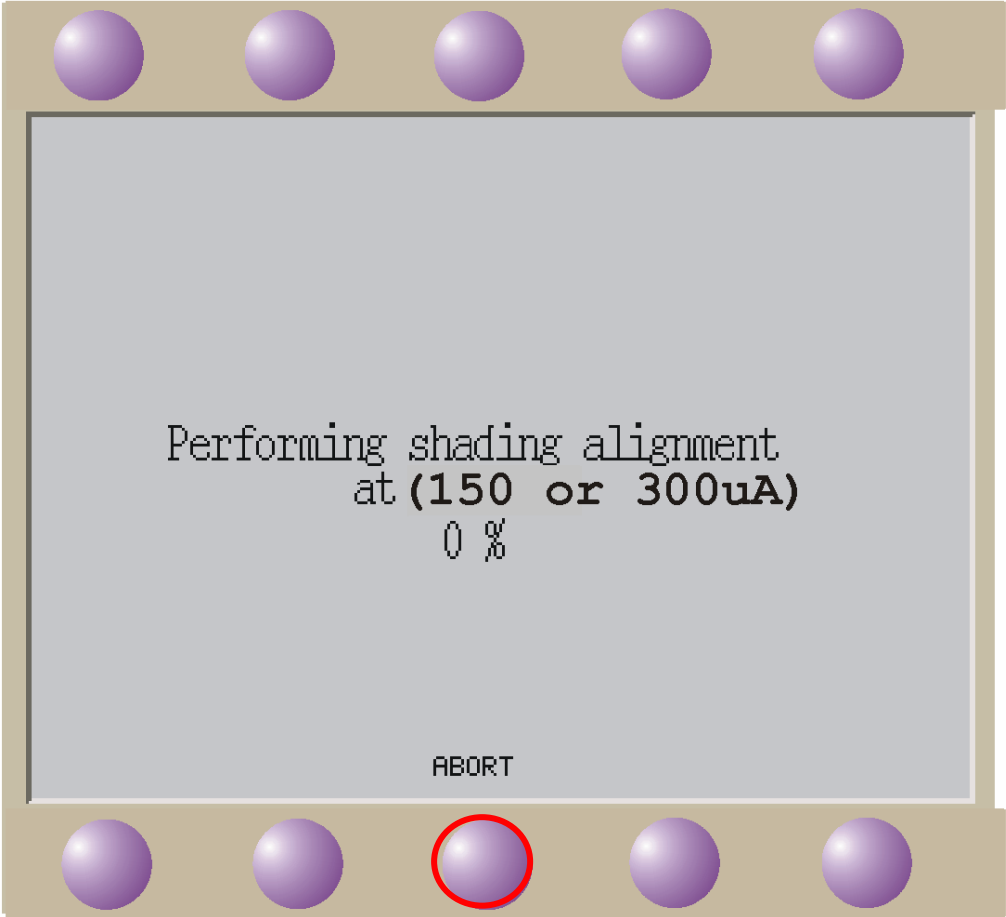
Fig 14 Perform Auto Align Status
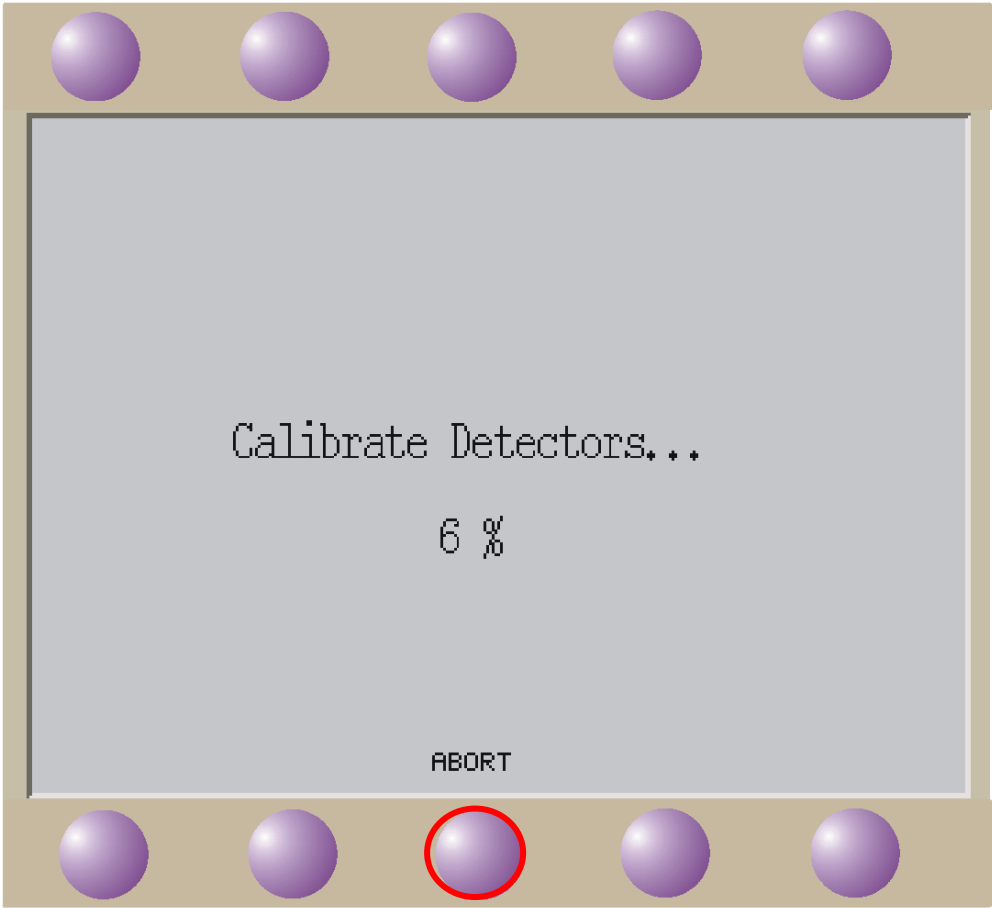
Fig 15 Perform Detector Calibration Status

Reset timecode counter to zero
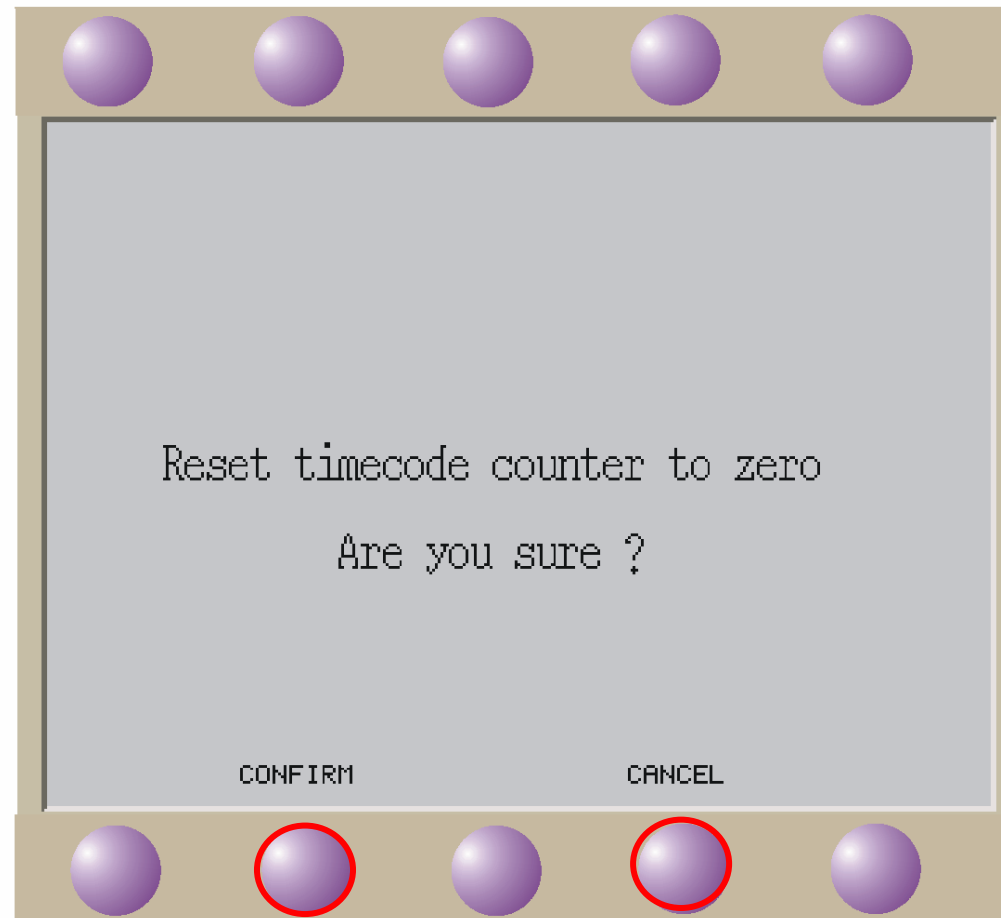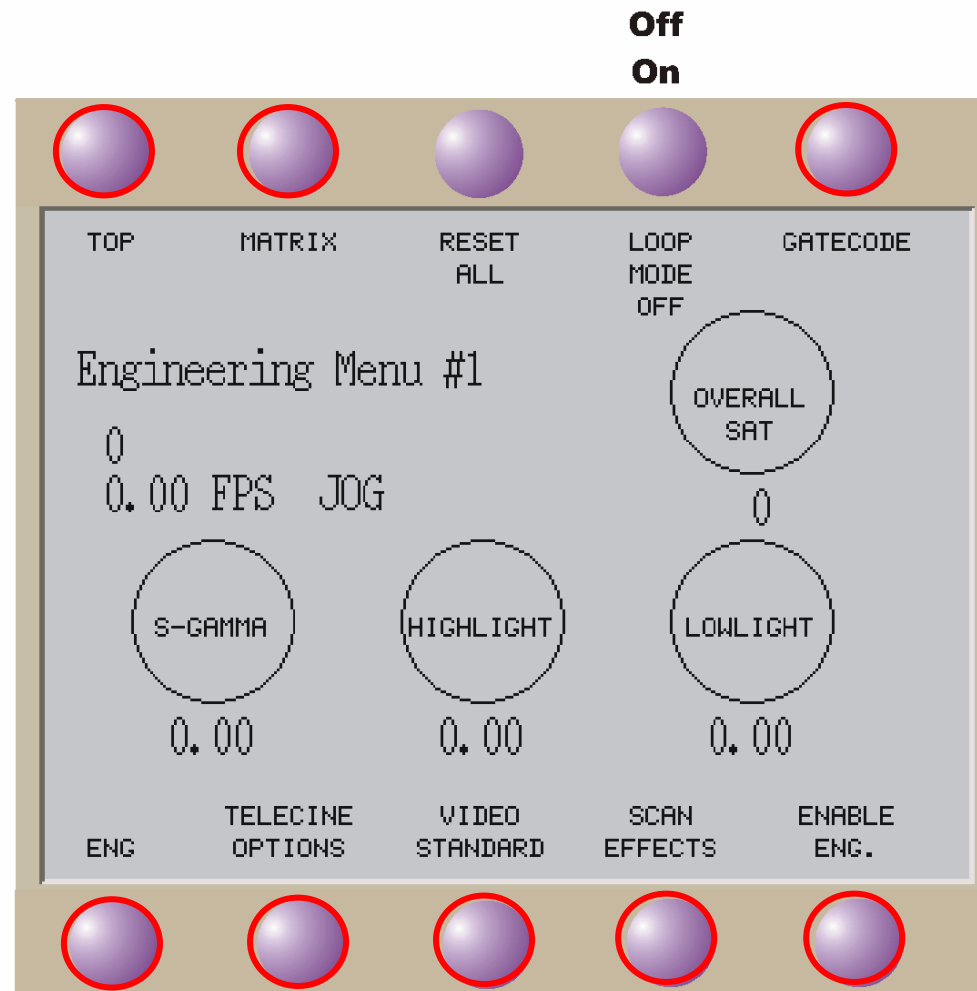
Are you sure ?

CONFIRM   CANCEL

Fig 16 Time Code Reset Confirm

Fig 17 Engineering # 1 Menu

UP

Gate Code Reader

Automatic

SELECT   PREVIOUS   NEXT
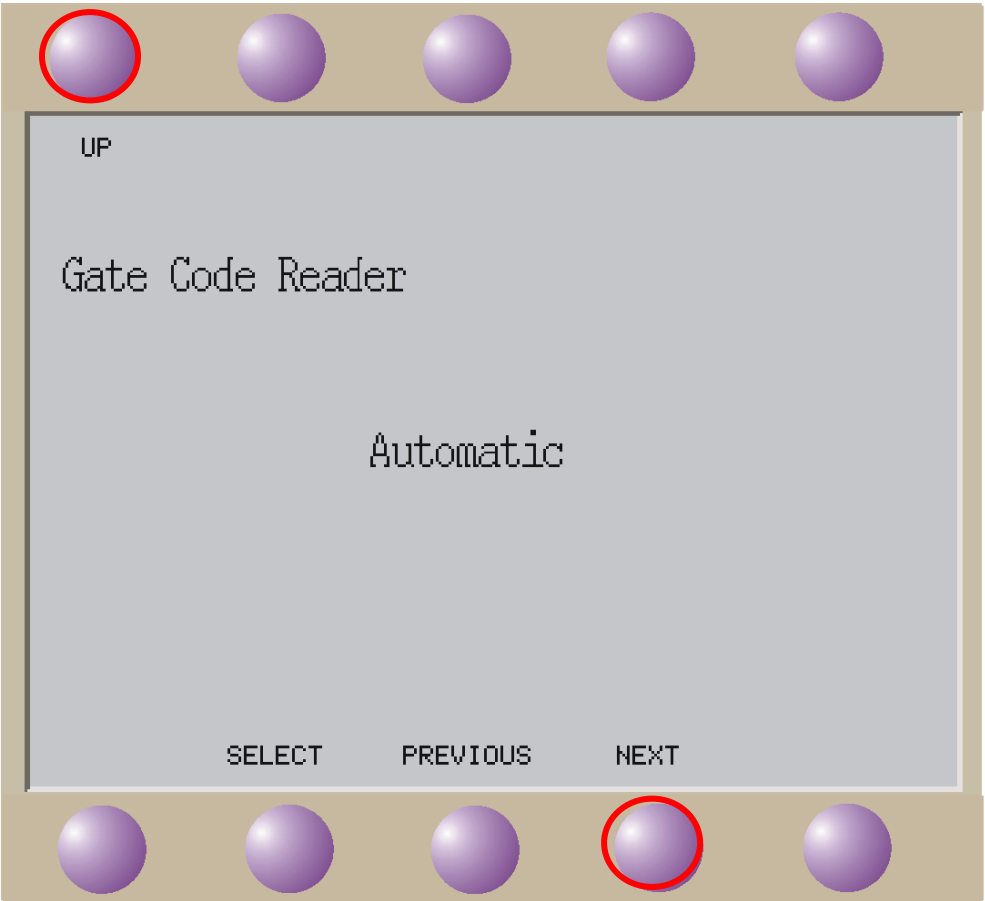
Fig 18 Gate Code Menu Showing Automatic Selection

UP

Gate Code Reader

* Manual (HD Super s35mm)

SELECT   PREVIOUS   NEXT

*
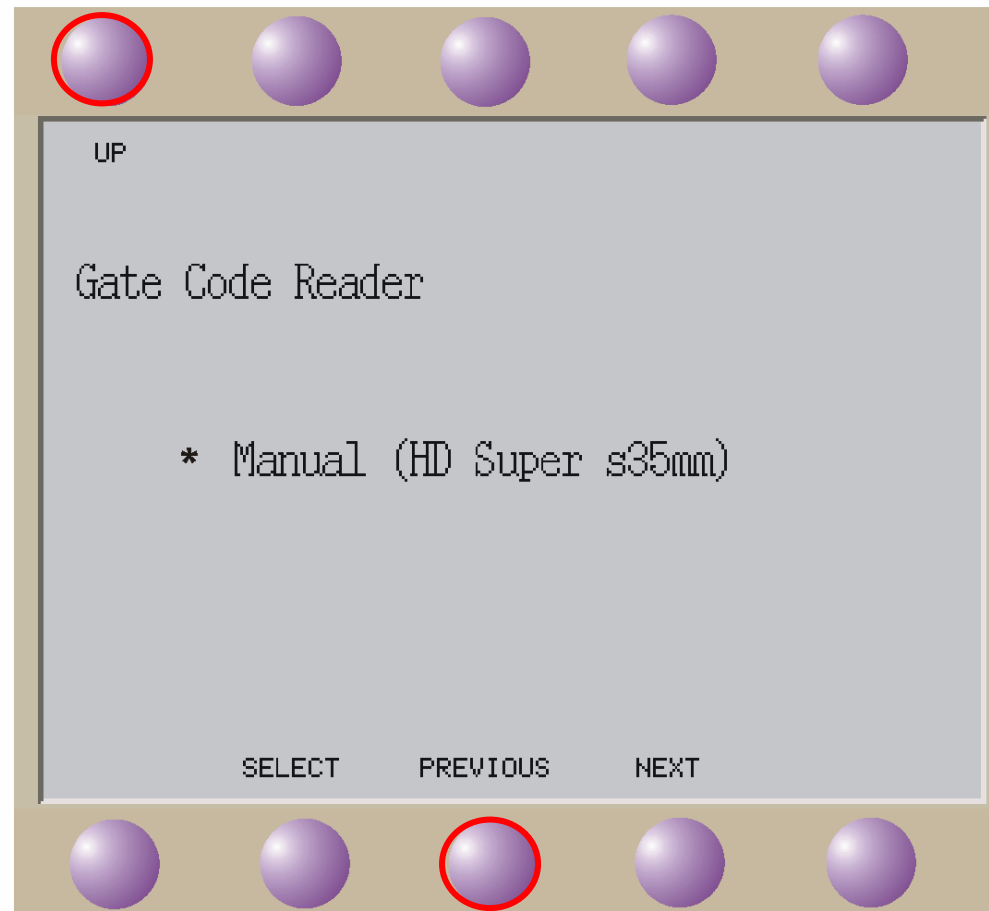
**Selection
depends on
availability**

Fig 19 Gate Code Menu Showing Manual Selection
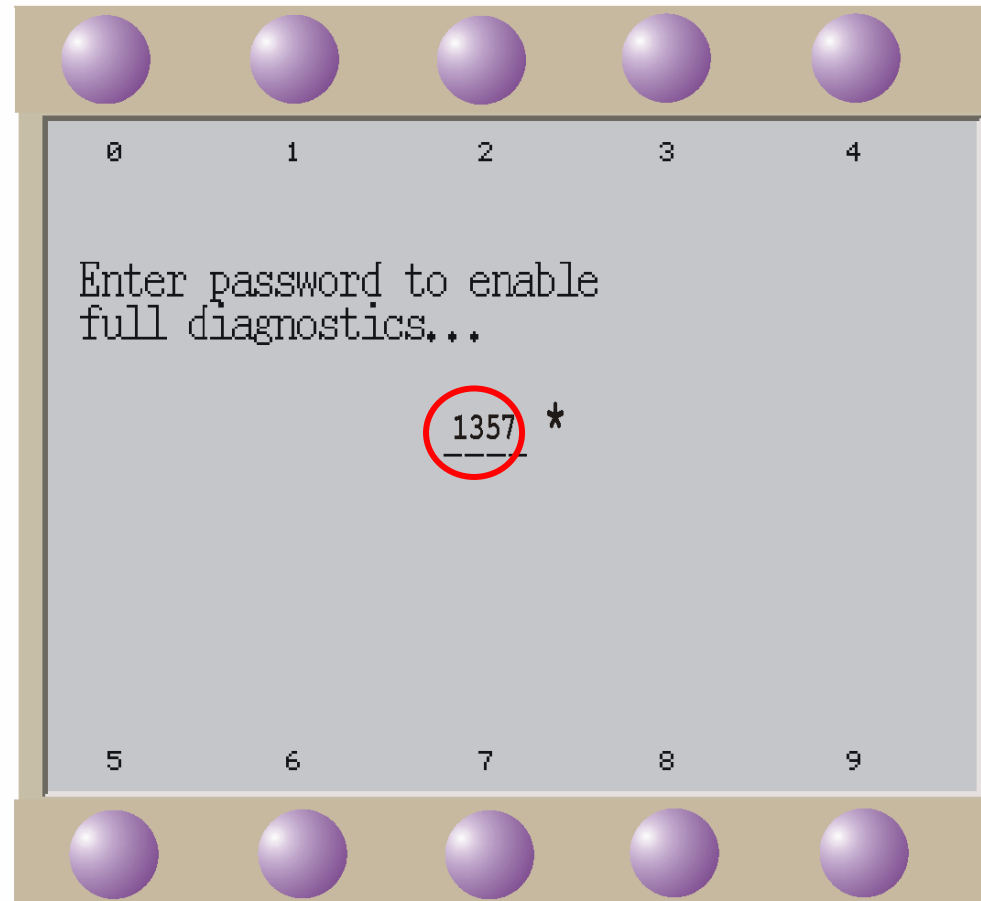
Fig 20 Engineering Enable Anti Alias Control
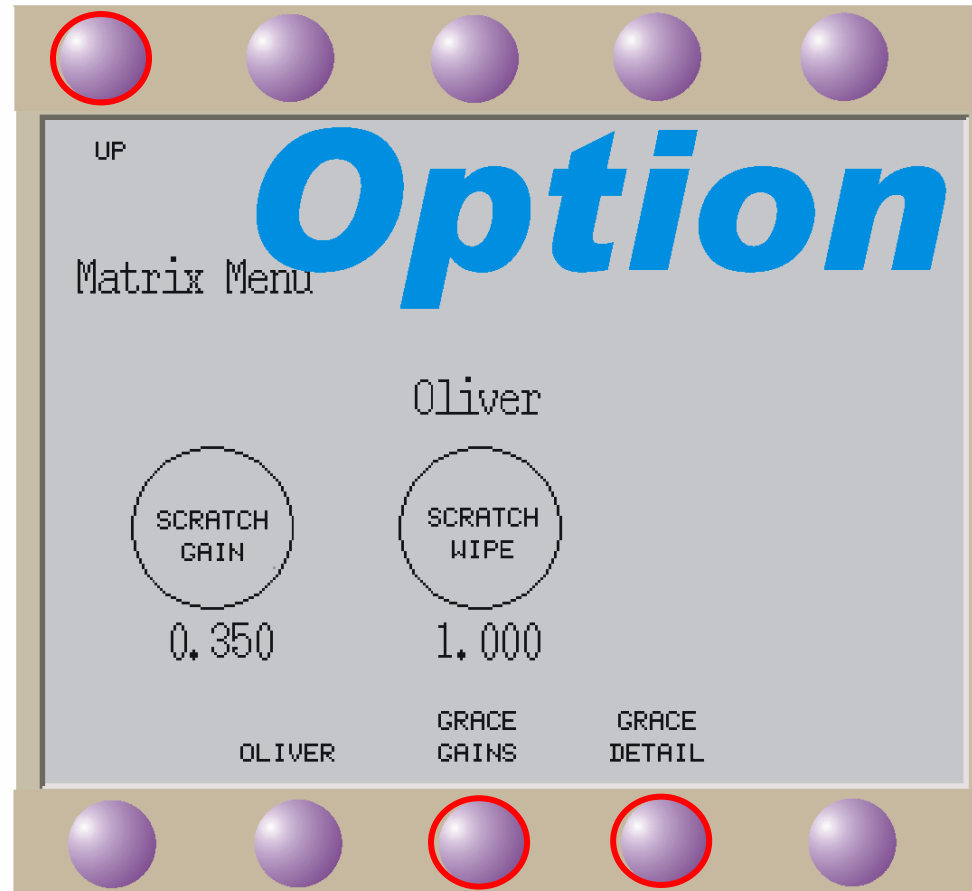
Fig 21 Matrix Menu, Oliver Setup
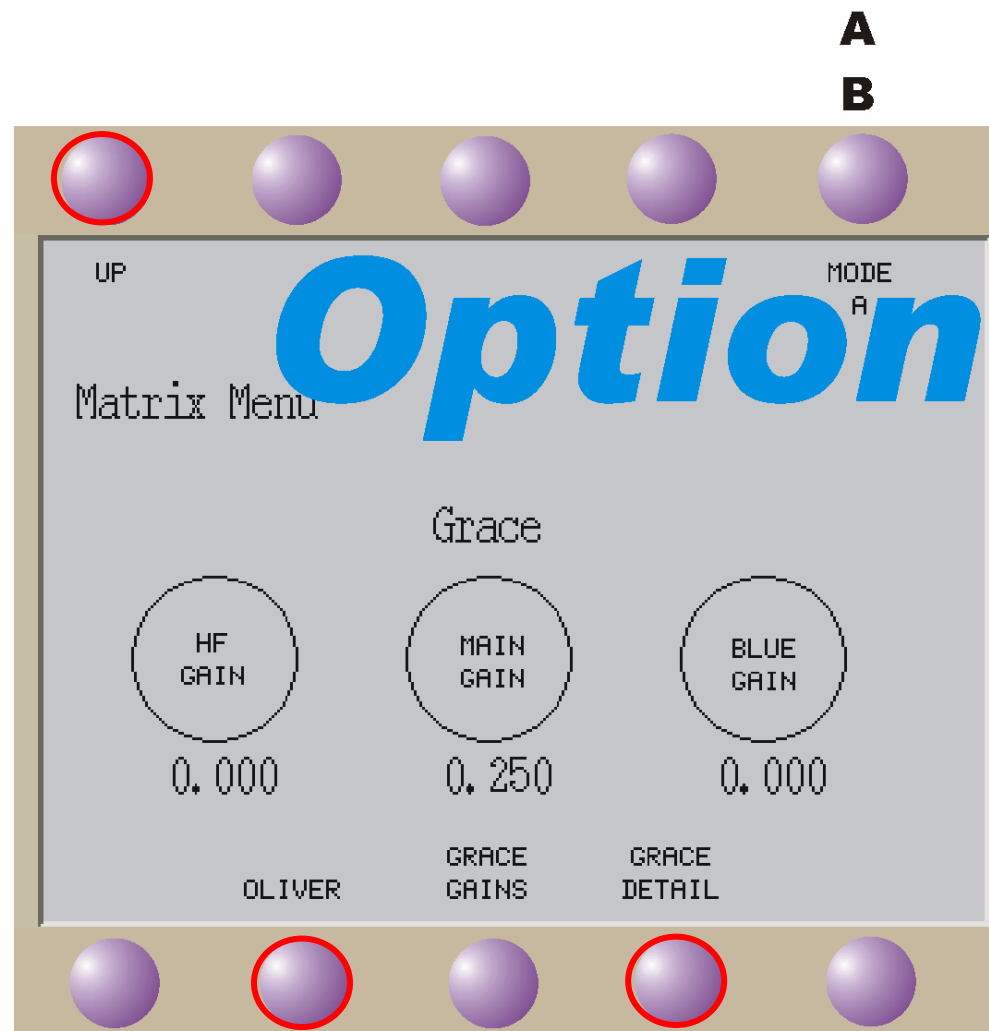
Fig 22 Matrix Menu, Grace Gains Setup
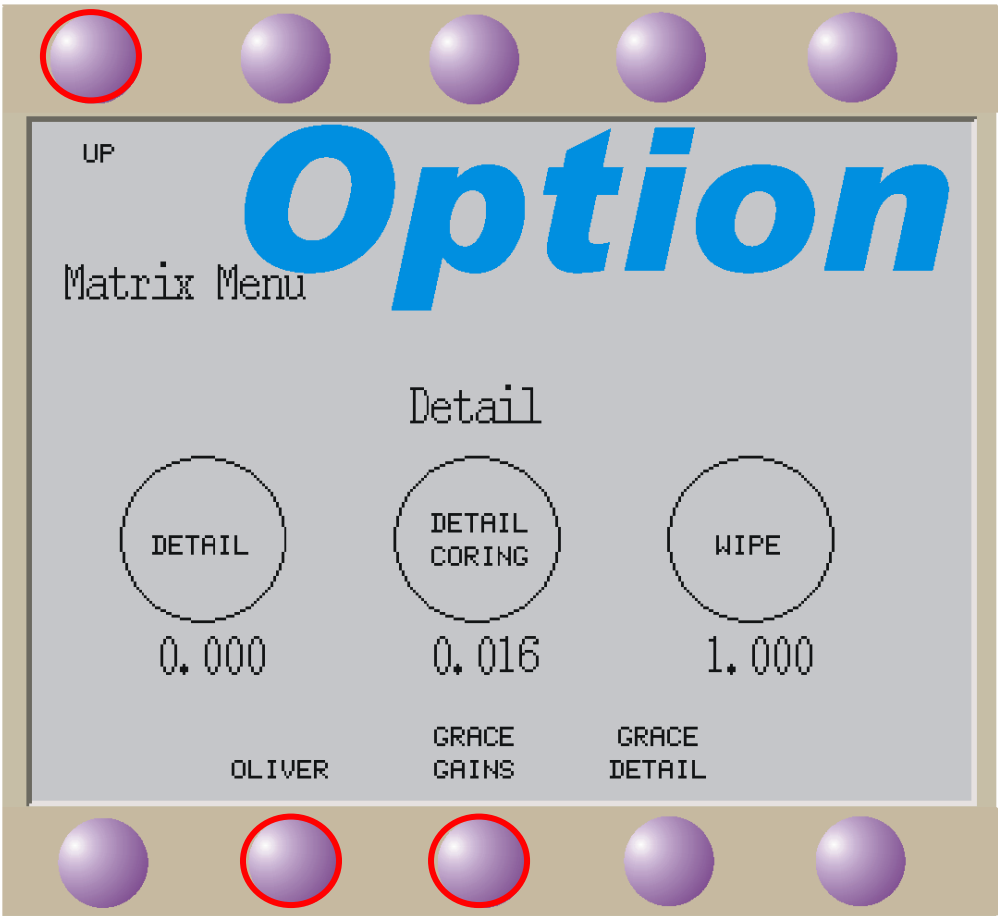
Fig 23 Matrix Menu, Grace Detail Setup

Fig 24 Lifetime Options

UP

Time Limited Options

-> No options in this category

LIFETIME
OPTIONS

TIME
LIMITED
OPTIONS
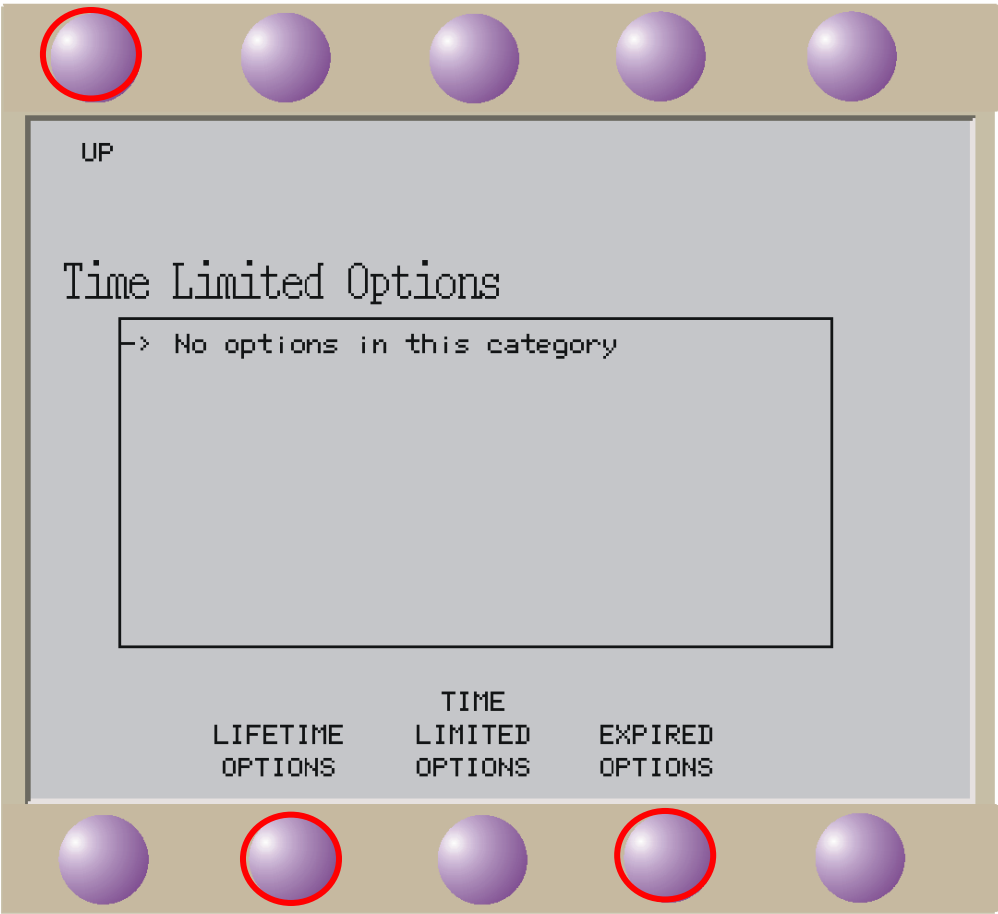
EXPIRED
OPTIONS

Fig 25 Time Limited Options
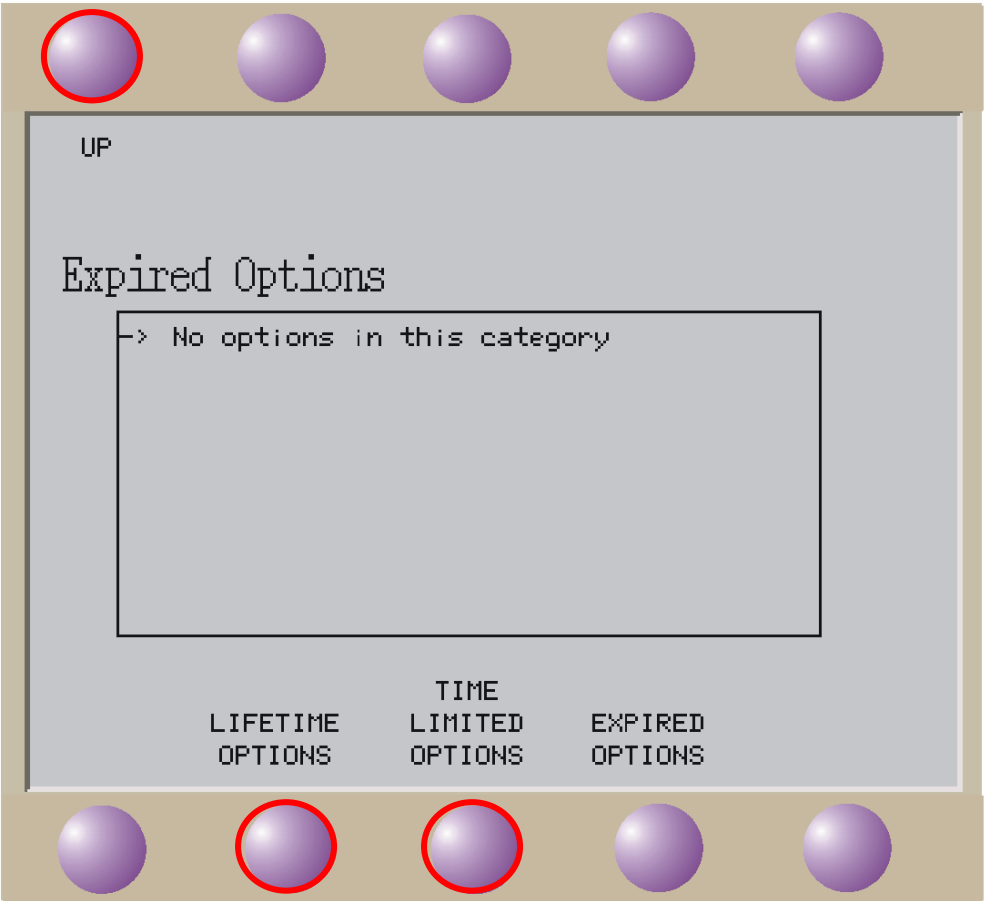
Fig 26 Expired Options

Fig 27 SD Video Standards Menu

Fig 28 HD Video Standards Menu

Select by
rotating Digipots

Option

Fig 29 DATA Standards Menu

Select video standard

625 50 / 50fps FPF

Are you sure ?

CONFIRM   CANCEL

Fig 30 Standards Confirmation

Standard dependent

Enabled

Disabled

Interlaced

Non Interlaced

Progressive

64

0

939

1019

UP   BREAKOUT NON-INTERLACED   BLACK   WHITE
             DISABLED   FPF SCAN   CLIP   CLIP
                                          64   939

Video Setup

```
                        1 perf per frame
                        2 perfs per frame
                        3 perfs per frame
                     -> 4 perfs per frame
                        6 perfs per frame
```
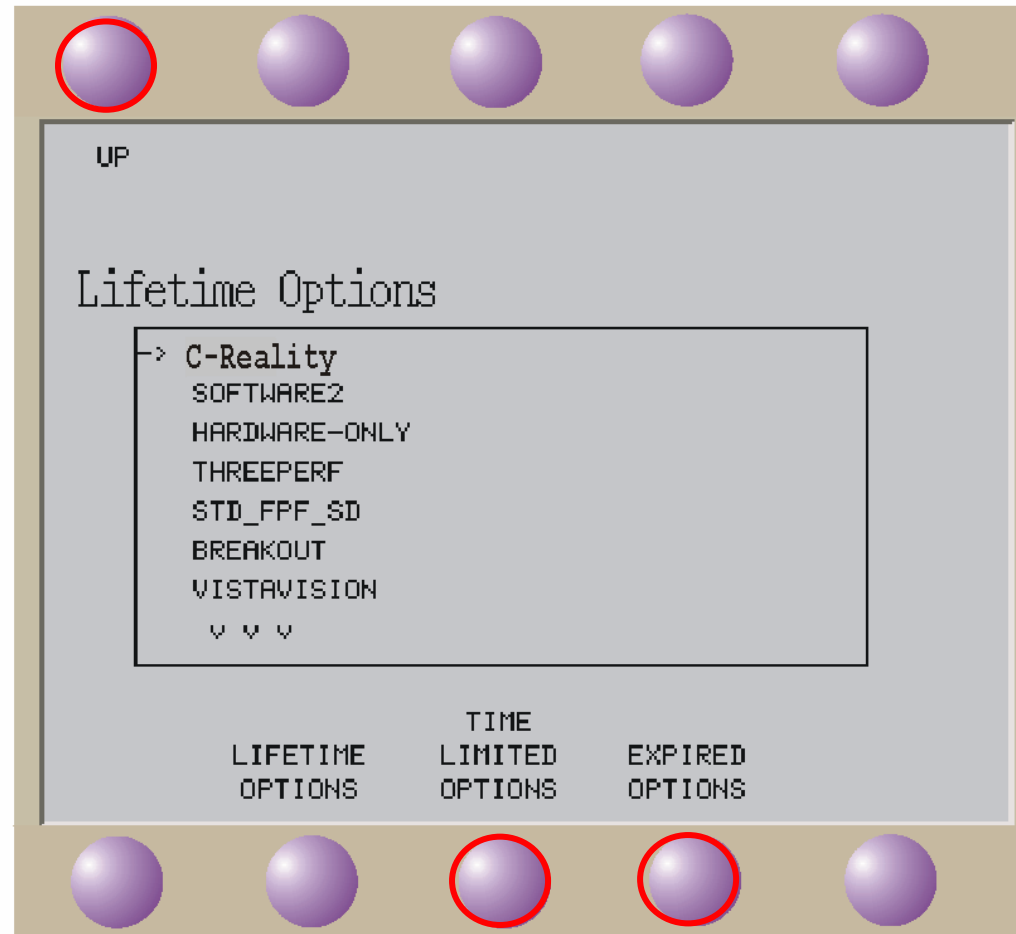
Select by rotating Digipots

OUTPUT   GEN LOCK   VIDEO   FIELD   SELECT
4:4:4   Free Run   ROUNDING   DOM   PERFS
 RGB   10   ODD   PER
                                                  FRAME

4:2:2 Y Cr Cb

4:4:4 Y Cr Cb

4:4:4 RGB

Free Run

SD Analog

SD Digital

8

10

12

Odd

Even

Some Menus depend on Standard selected & Engineering Selected

Fig 31 Video Setup Menu

Off

Wait

Ready

On

UP   EHT   RESET   ZOOM
        OFF   ROTATE

Scan Effects Menu

Horizontal Keystone (linear)

DEPTH   SHIFT   CYCLES

0.00   0.00   4

* X Y Skew

Linear

Fisheye

Tunnel

Sine 1-8

Triangle 1-8

FOCUS
EFFECTS   X SKEW   Y SKEW   X TILT   Y TILT

*   *****   **Linear**   **Linear**

                          Sine   **Sine**

                        Triangle   **Triangle**

Fig 32 Scan Effects Menu Showing H Linear Keystone

Off

Wait

Ready

On

UP EHT RESET ZOOM
    OFF   ROTATE

Scan Effects Menu

Vertical Skew (linear)

DEPTH   SHIFT

0.00   0.00

* <u>X Y Skew</u>
Linear
Fisheye
Tunnel
Sine 1-8
Triangle 1-8

FOCUS
EFFECTS X SKEW Y SKEW X TILT Y TILT

*   *****   **Linear** **Linear**
          Sine   **Sine**
         Triangle **Triangle**
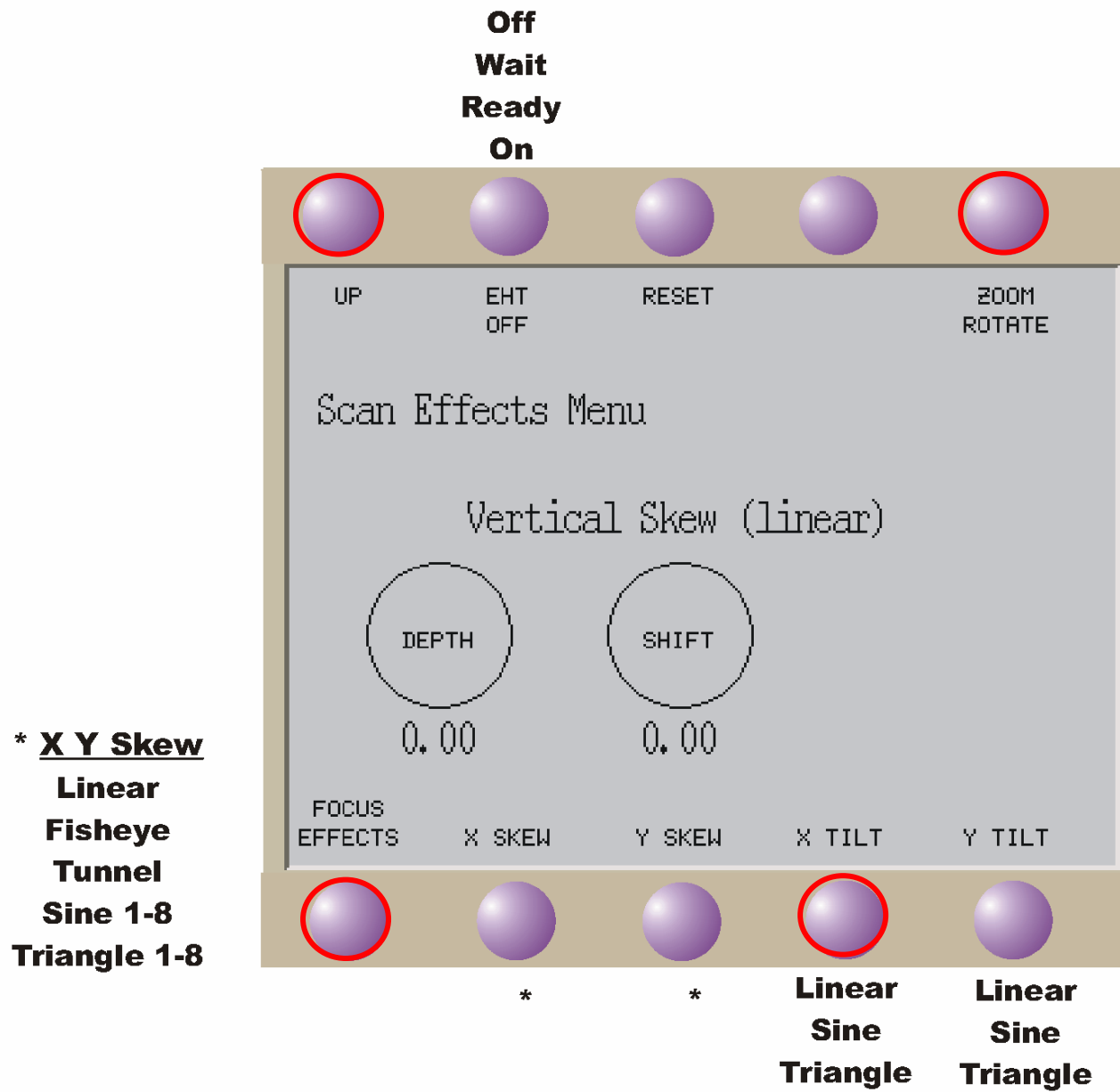
Fig 33 Scan Effects Menu Showing V Linear Skew

Off

Wait

Ready

On

UP EHT   RESET   ZOOM
    OFF   ROTATE

Scan Effects Menu

Focus Effects

COARSE   FINE

0   0

* <u>X Y Skew</u>

Linear

Fisheye

Tunnel

Sine 1-8

Triangle 1-8

FOCUS
EFFECTS X SKEW Y SKEW X TILT Y TILT

*   *   Linear Linear

Sine   Sine

Triangle Triangle
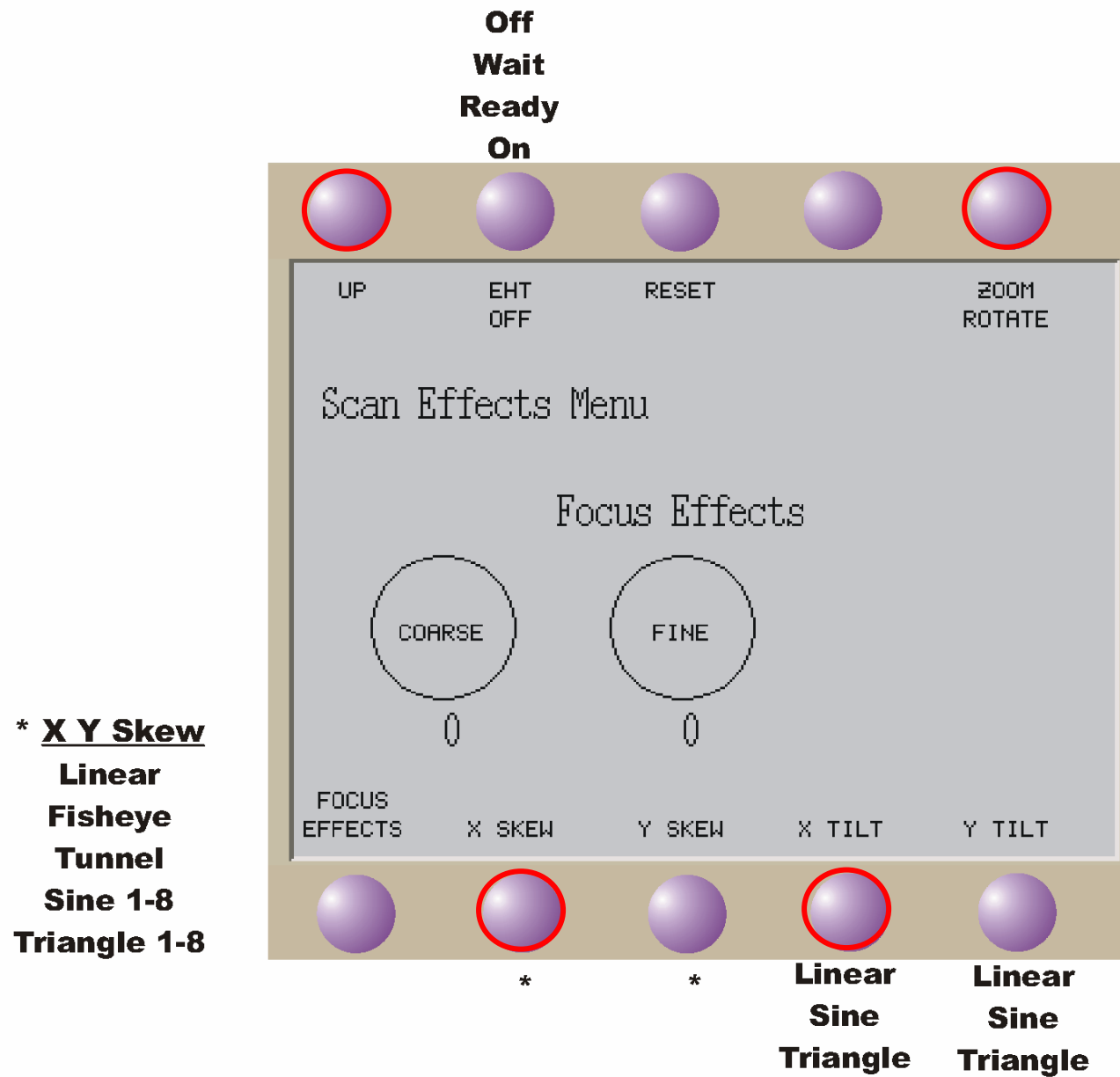
Fig 34 Scan Effects Menu Showing Focus Effects

Off

Wait

Ready

On

UP   EHT   RESET   ZOOM
           OFF   ROTATE

Scan Effects Menu

Amplitude / Rotate

X AMP   Y AMP   ROTATE

1.00   1.00   0.00

* <u>X Y Skew</u>

Linear

Fisheye

Tunnel

Sine 1-8

Triangle 1-8

FOCUS
EFFECTS   X SKEW   Y SKEW   X TILT   Y TILT

*   *   Linear   Linear

Sine   Sine

Triangle Triangle

Fig 35 Scan Effects Menu Showing Rotate

Off
Wait
Ready
On

UP   EHT   RESET   ZOOM
            OFF   ROTATE

Scan Effects Menu

Pan / Zoom

X PAN   Y PAN   ZOOM

0   0   1.00

FOCUS
EFFECTS   X SKEW   Y SKEW   X TILT   Y TILT

* X Y Skew
Linear
Fisheye
Tunnel
Sine 1-8
Triangle 1-8

*   *   Linear   Linear
                      Sine   Sine
                      Triangle   Triangle

Fig 36 Scan Effects Menu Showing X Y Zoom

TOP   APC   TEST   DEBUG
                                  PATTERN

Engineering Menu #2

    00:00:00.00
    0.00 FPS JOG

              ANTI   DIFF   LOG
    ENG   ALIAS   CVP   PCC   MASKING
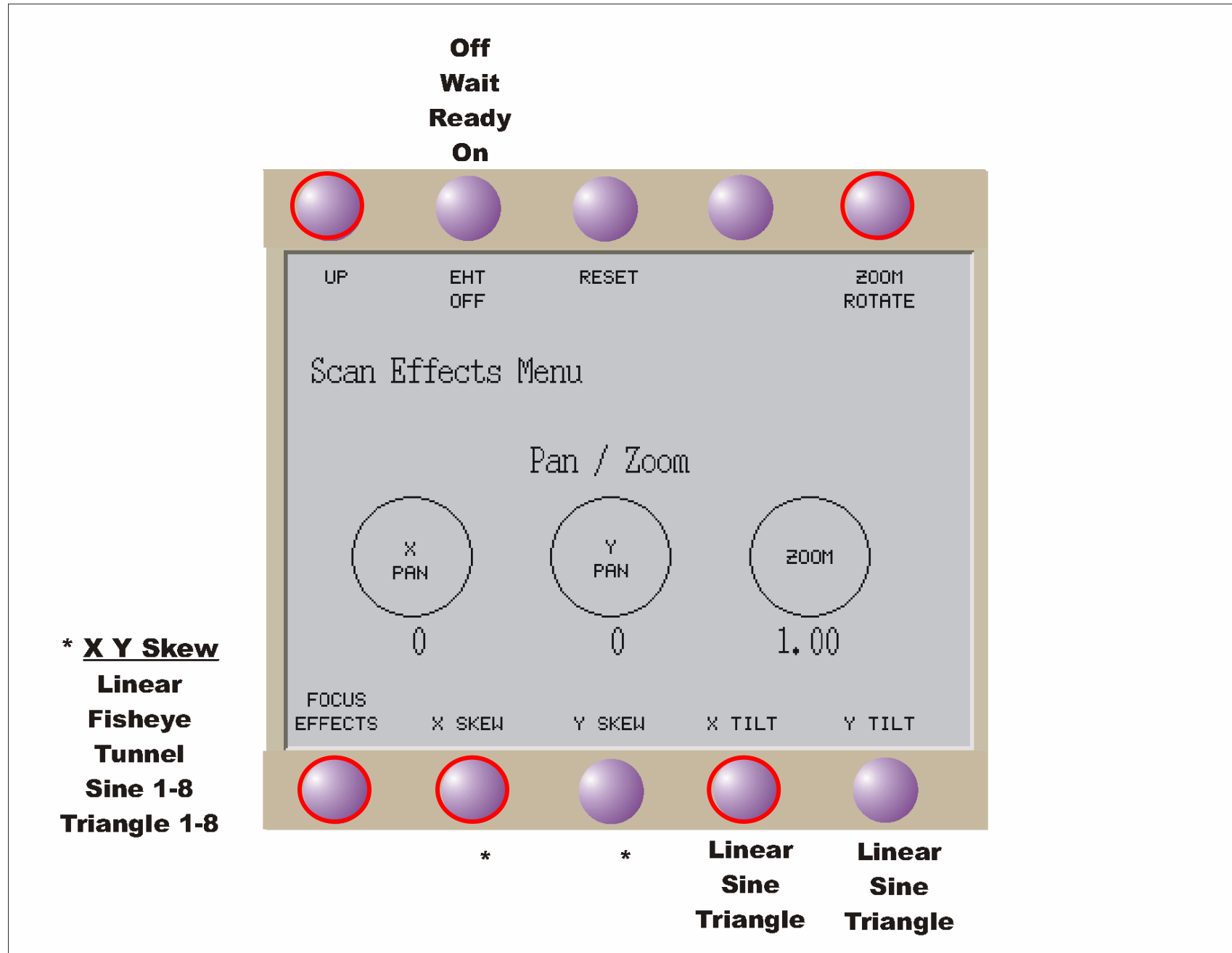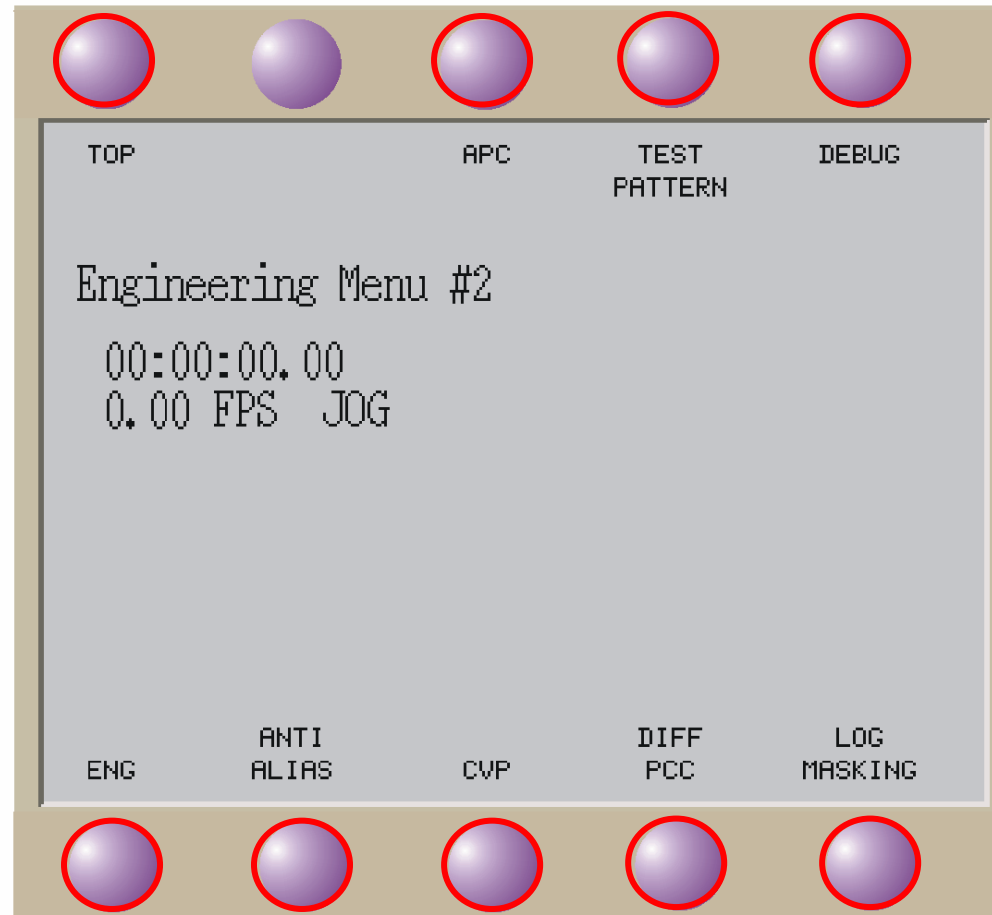
**Only available
in SD video
mode**

Fig 37 Engineering #2 Menu

Red

Green (mode shown)

Blue
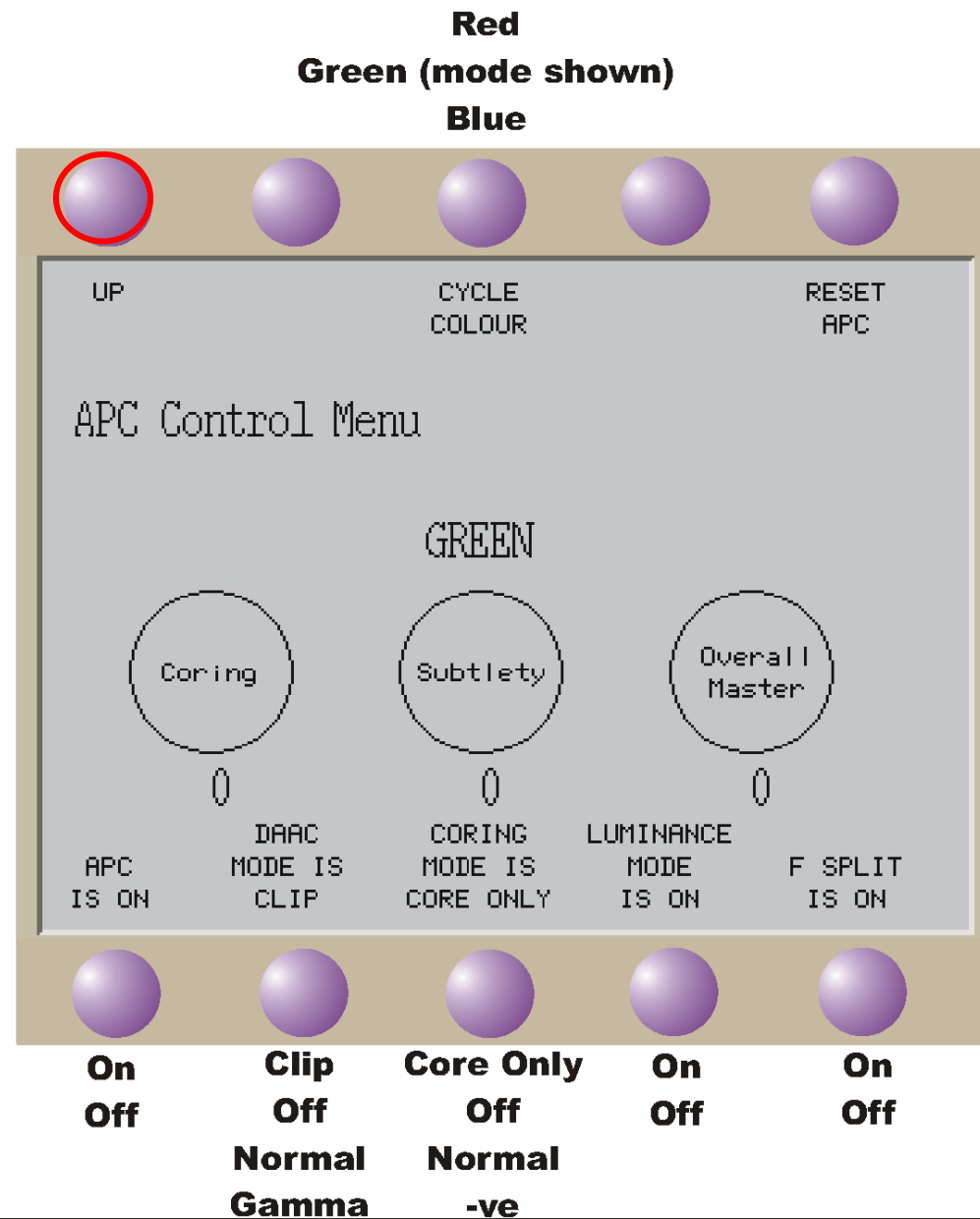
Fig 38 Aperture Correction Menu

Off

On

UP   DISABLE   ADC
                         OFF   PIXCON   MATRIX

Test Pattern Menu

Option

                                    D1OUT

PCC   LUTE   OFF

Fig 39 Test Pattern Menu

Horiz

Vert

1
2*
3*

UP   DISABLE   VERT   FLAT
                                                           FIELD

PCC Test Pattern

LINEAR   COLOUR   FREQUENCY   HUE
SWEEP   BARS   SWEEP   SWEEP 2

1
2*

1
2

* Engineering Mode Only

Fig 40 PCC Test Pattern Menu

1
2*
3*

Horiz

Vert

UP   DISABLE   HORIZ

Pixcon Test Pattern

LINEAR   COLOUR   FREQUENCY   HUE
SWEEP   BARS   SWEEP   SWEEP 2

* Engineering Mode Only

1
2*

1
2

Fig 41 Pixcon Test Pattern Menu

Horiz
Vert

UP   DISABLE   VERT   ROLLING
                                                                RAMP

Breakout Test Pattern

Option

COLOUR   LINEAR   JAIL   HF   USER
BARS   SWEEP   BARS   BARS   PATTERN

Fig 42 Breakout Test Pattern Menu

Fig 43 Debug File Filter Menu

```
          UP          FILTER                    TOP        BOTTOM

%W SC   Using default film dependant machine
   defaults
%E SC   Can't load PEC gate dep machine defaults
%W SC   Using default PEC gate dep machine defaults

%W SC   PEC alignment is out of date for this gate
%W SC   PEC alignment is out of date for this gate
%E SC   Can't load scan align data
%W SC   Using default scan align data
%W SC   PEC alignment is out of date for this gate
%E CP   Can't load transport std-dep machine
   defaults
%E CP   Error reading from desk control panel port:
   OK
[End-of-File]
```

Fig 44 Debug Running Example

Select
using
Digipot

UP

Select file to be displayed...

```
-> Current boot log
   Install log
   Boot log from 11:41 NOV 26 2003
   Boot log from 10:52 NOV 26 2003
   Boot log from 10:49 NOV 25 2003
   Boot log from 16:40 NOV 24 2003
   Boot log from 15:25 NOV 24 2003
    ∨ ∨ ∨
```

DISPLAY
FILE

Fig 45 Debug Task Menu

Off

Wait

Ready

On

UP   EHT
          OFF

Log Masking Menu

POS1 (5381)

PREDEF
TYPE

* **Predef Type**
   None
   Pos1(5381)
   Pos2
   Neg1(Vision)
   Neg2(Prime)
   IP(5244)
   User (RGB)

*

Fig 46 Log Mask Menu

Off

Wait

Ready

On

UP   EHT
            OFF

Log Masking Menu

NONE

PREDEF
TYPE

* **Predef Type**
Pos1(5381)
Pos2
Neg1(Vision)
Neg2(Prime)
IP(5244)
User (RGB)

*

Fig 47 Log Mask (None)

Off

Wait

Ready

On

UP   EHT   RESET
           OFF

Log Masking Menu

* Predef Type
Pos1(5381)
Pos2
Neg1(Vision)
Neg2(Prime)
IP(5244)
User (RGB)

Blue Channel

RED   GREEN   BLUE

0.00   0.00   0.00

                                        PREDEF
    RED   GREEN   BLUE   TYPE

*

Fig 48 Log Mask User

Fig 49 CVIP Menu

Fig 50 CVIP Vector Select

Select using Digipot

UP

Vector highlight mode

-> Disabled
   Desaturate single vector
   Desaturate all vectors
   Mid-grey single vector
   Mid-grey all vectors
   R/Y/G/C/B/M
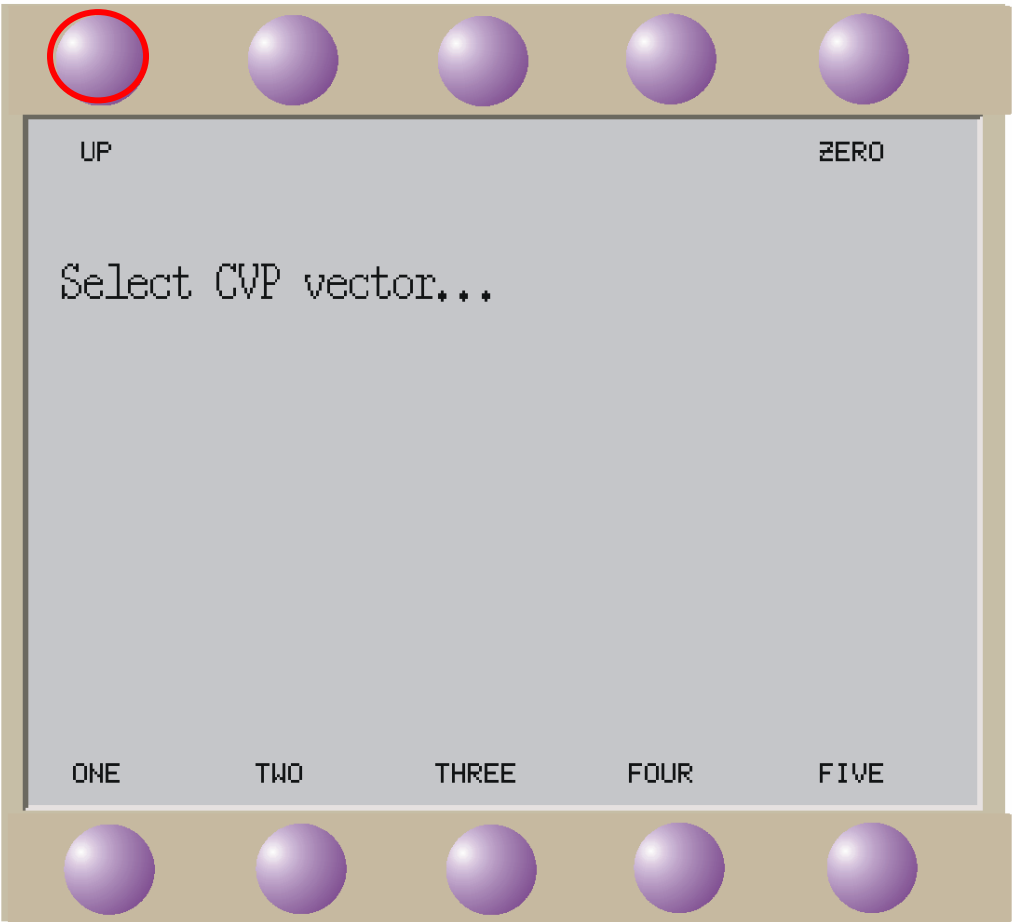
SELECT   DISABLE
HIGHLIGHT   CVP
  MODE   HIGHLIGHT
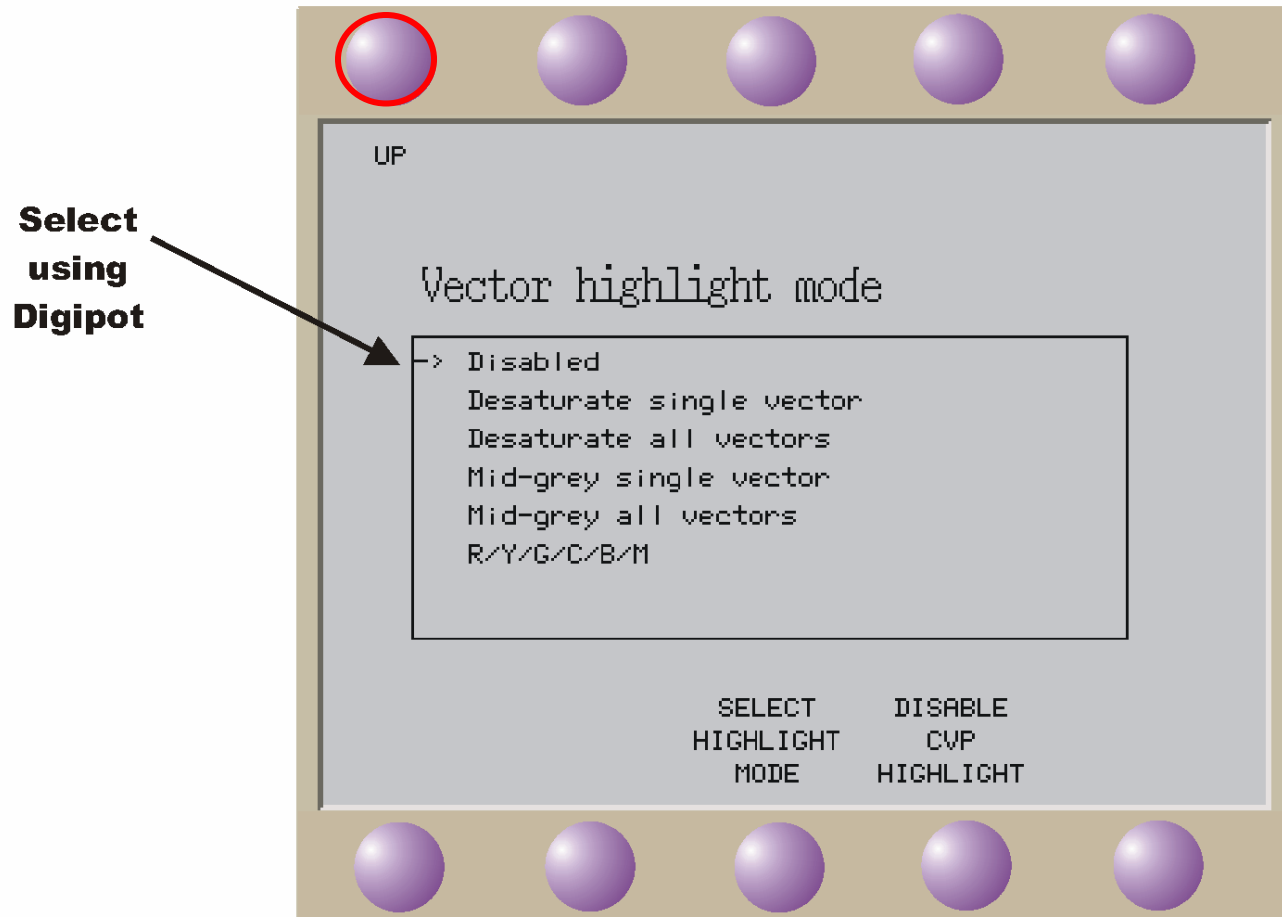
Fig 51 CVIP Vector Highlight Menu

Pre-Gamma Lift

Pre-Gamma Gain

Gamma

Post-Gamma Lift

Post-Gamma Gain

UP   MODE   RESET
                                                                   DIFF

PCC Control Menu

Post-Gamma Lift

MASTER   X   Y

0.000   0.000   0.000

S-GAMMA   KNEE   HIGH   LOW
                         LIGHT   LIGHT
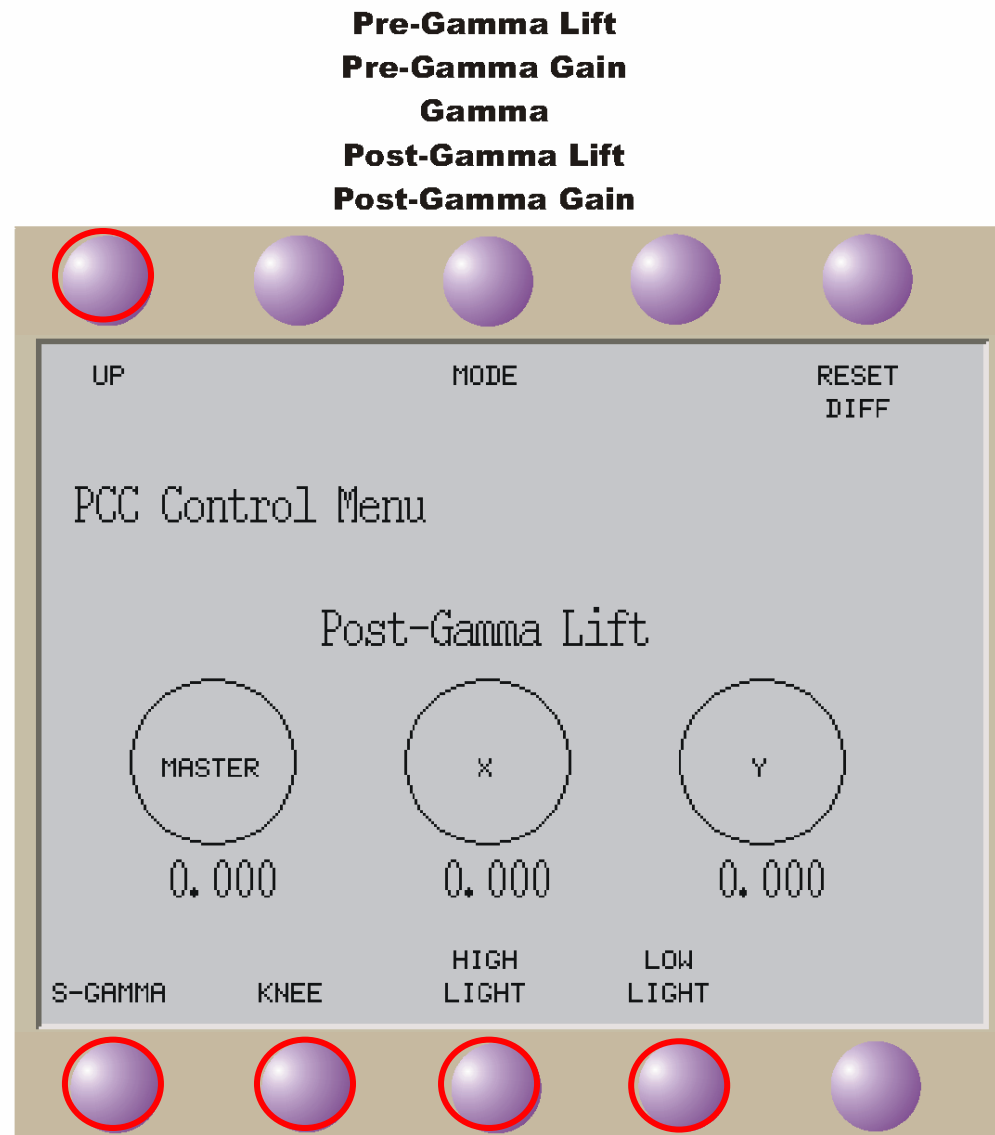
Fig 52 Differential PCC Menu

Pre-Gamma Lift

Pre-Gamma Gain

Gamma

Post-Gamma Lift

Post-Gamma Gain
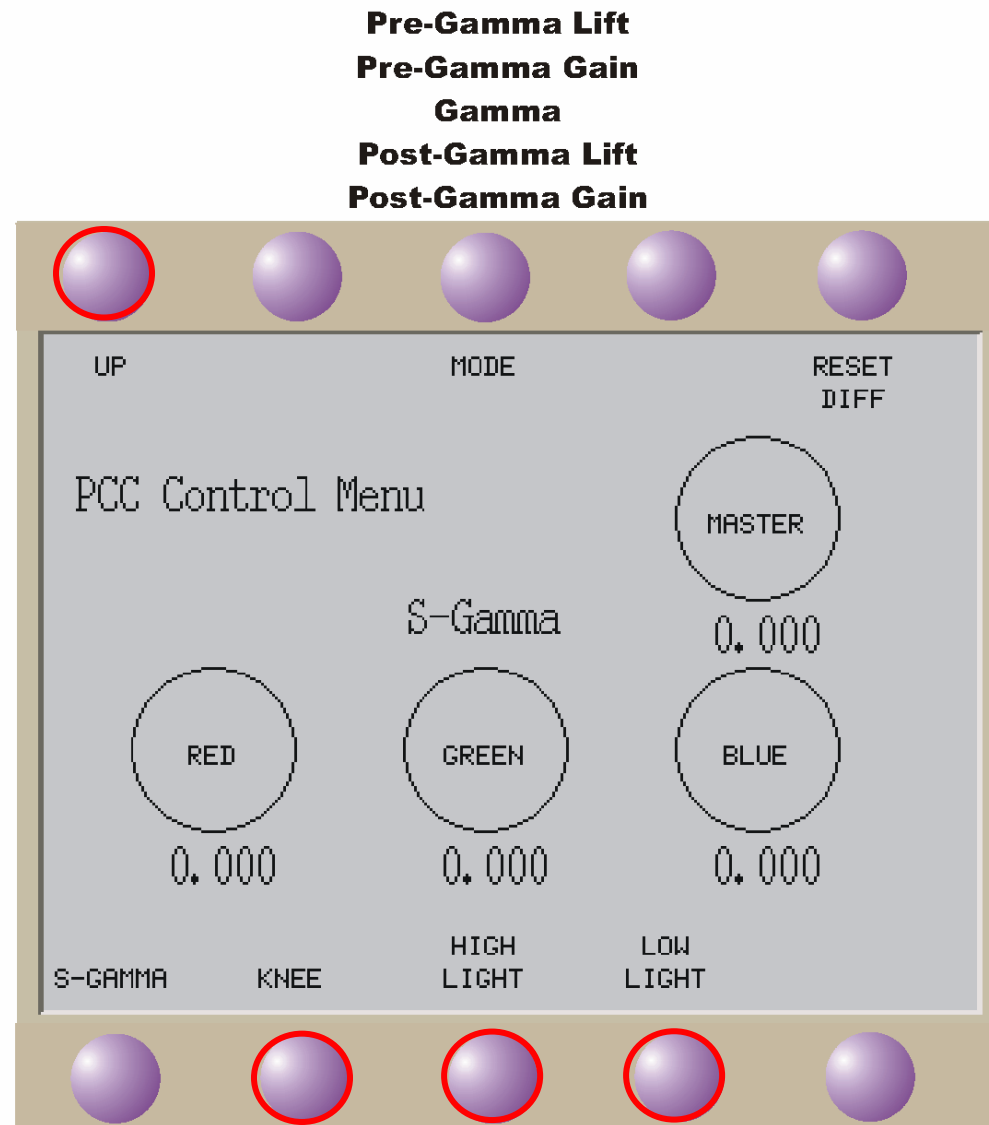
Fig 53 Differential PCC S Gamma

Pre-Gamma Lift

Pre-Gamma Gain

Gamma

Post-Gamma Lift

Post-Gamma Gain
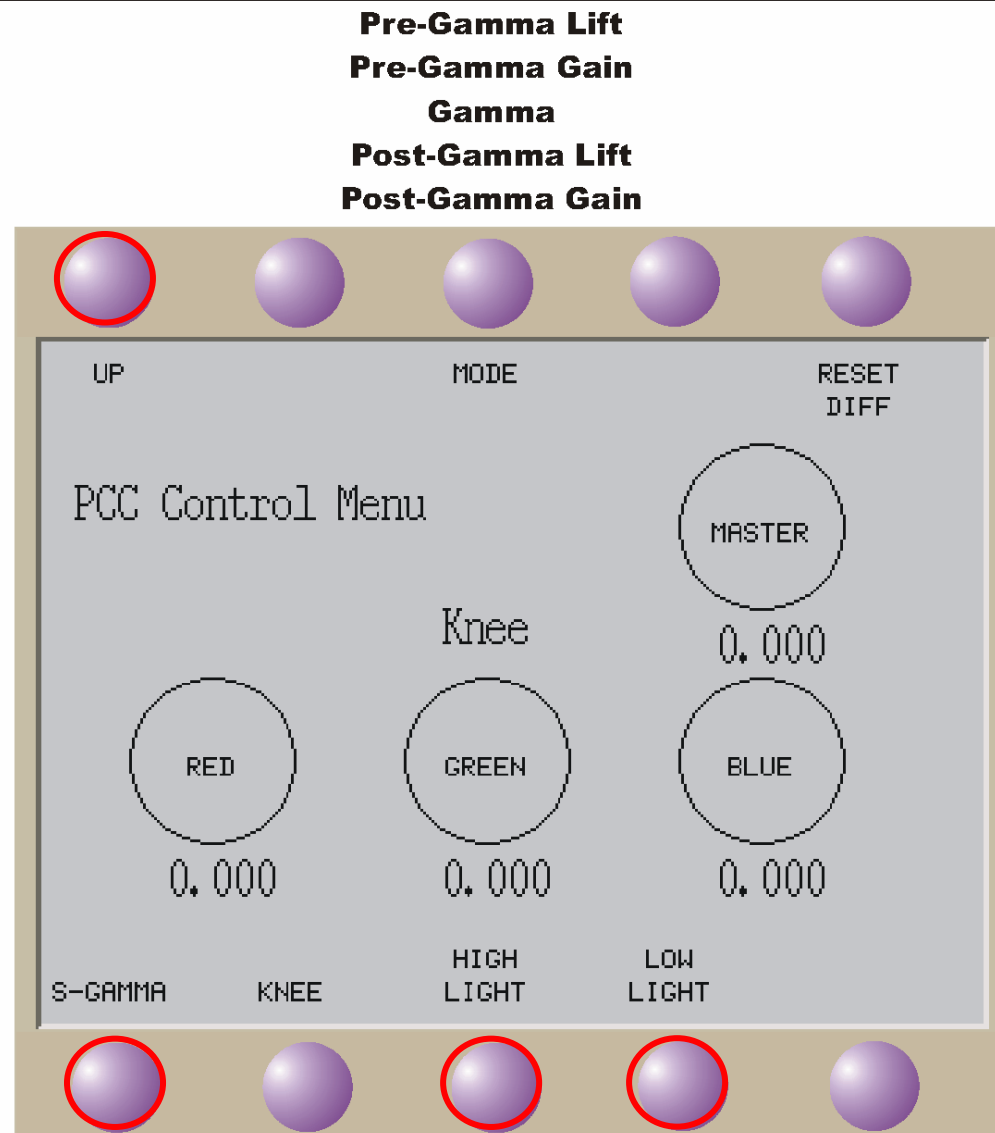
Fig 54 Differential PCC Knee

Pre-Gamma Lift

Pre-Gamma Gain

Gamma

Post-Gamma Lift

Post-Gamma Gain
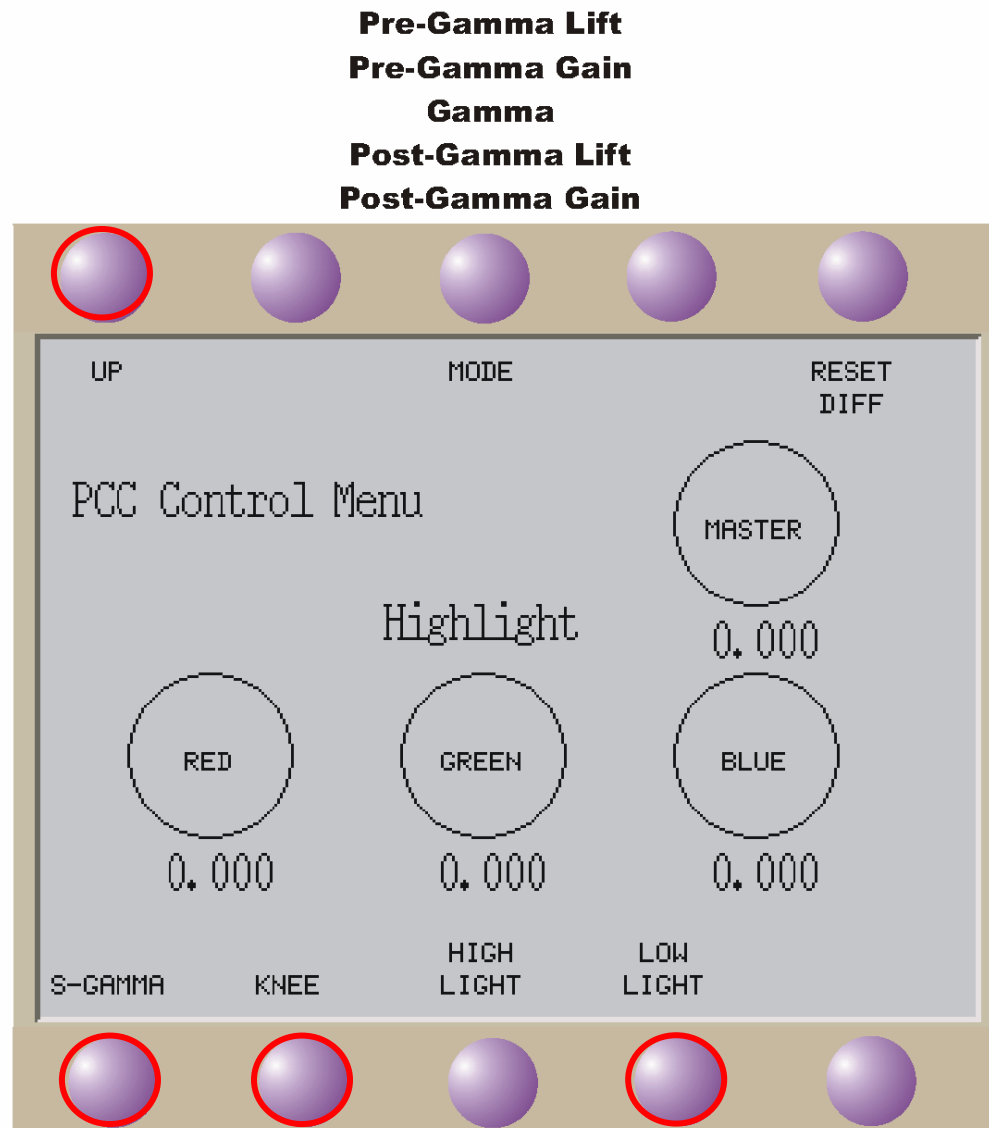
Fig 55 Differential PCC Highlight

Pre-Gamma Lift

Pre-Gamma Gain

Gamma

Post-Gamma Lift

Post-Gamma Gain
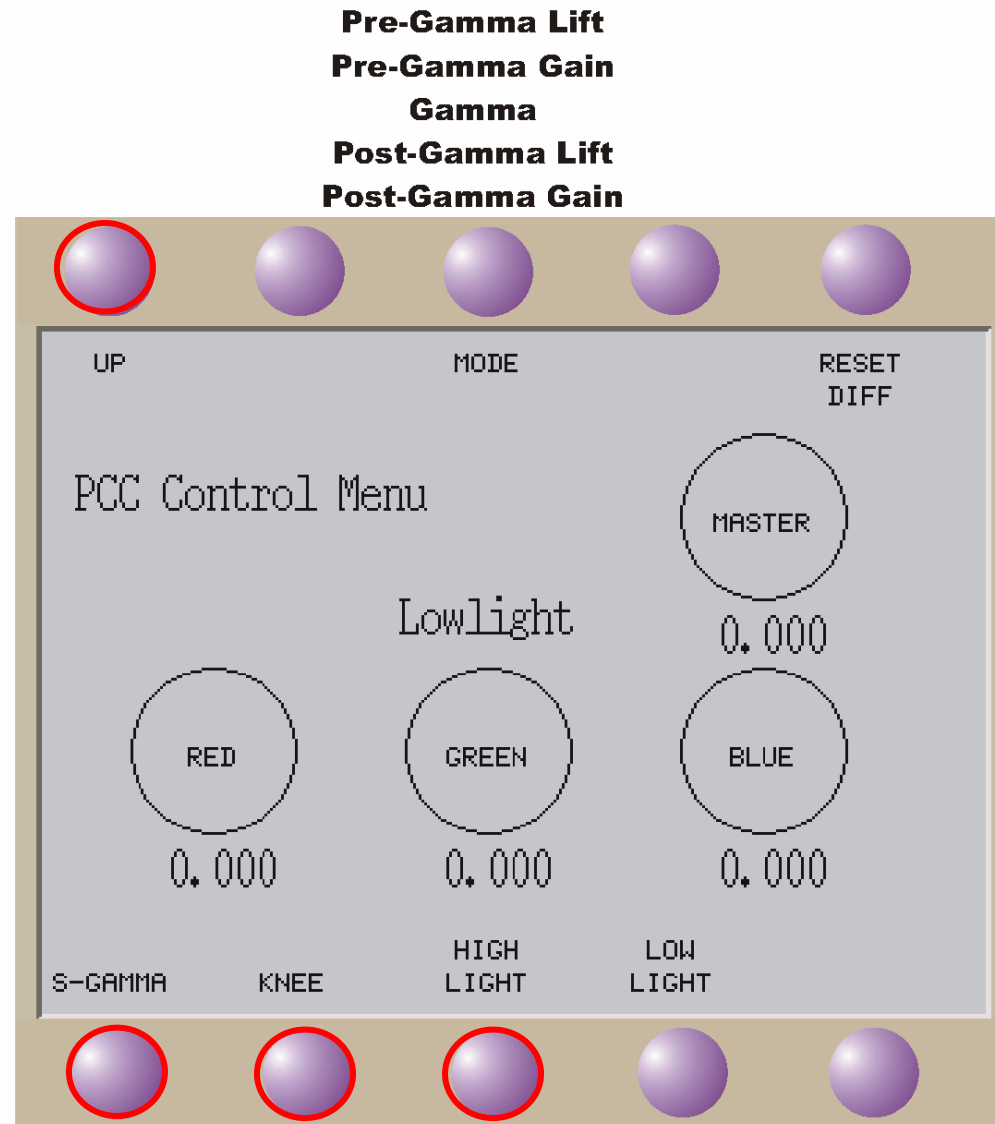
Fig 56 Differential PCC Lowlight

Off

Wait

Ready

On

UP   EHT
            OFF

Anti-Alias Control Menu

KAISER   CUTOFF

10000   0.40

ANTI-ALIAS
ENABLED

Enabled

Disabled

Fig 57 Anti Alias Control

TOP   OUTPUT   TRANSPORT REFSTORE
                   BLANKING CONFIG

Engineering Menu #3

 0
 0.00 FPS JOG

                              MANUAL   DATA
                              SHADING   OUTPUT
 ENG
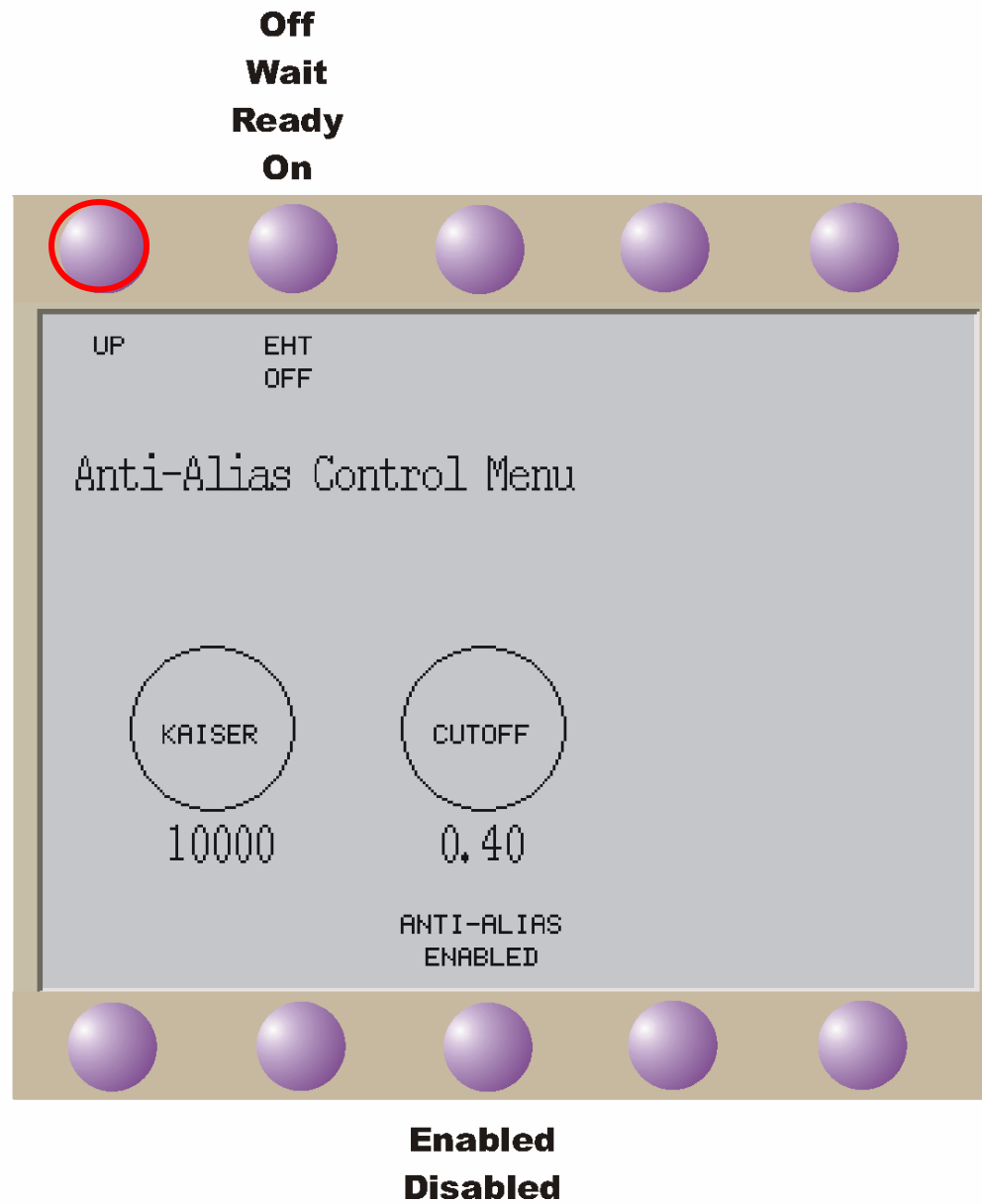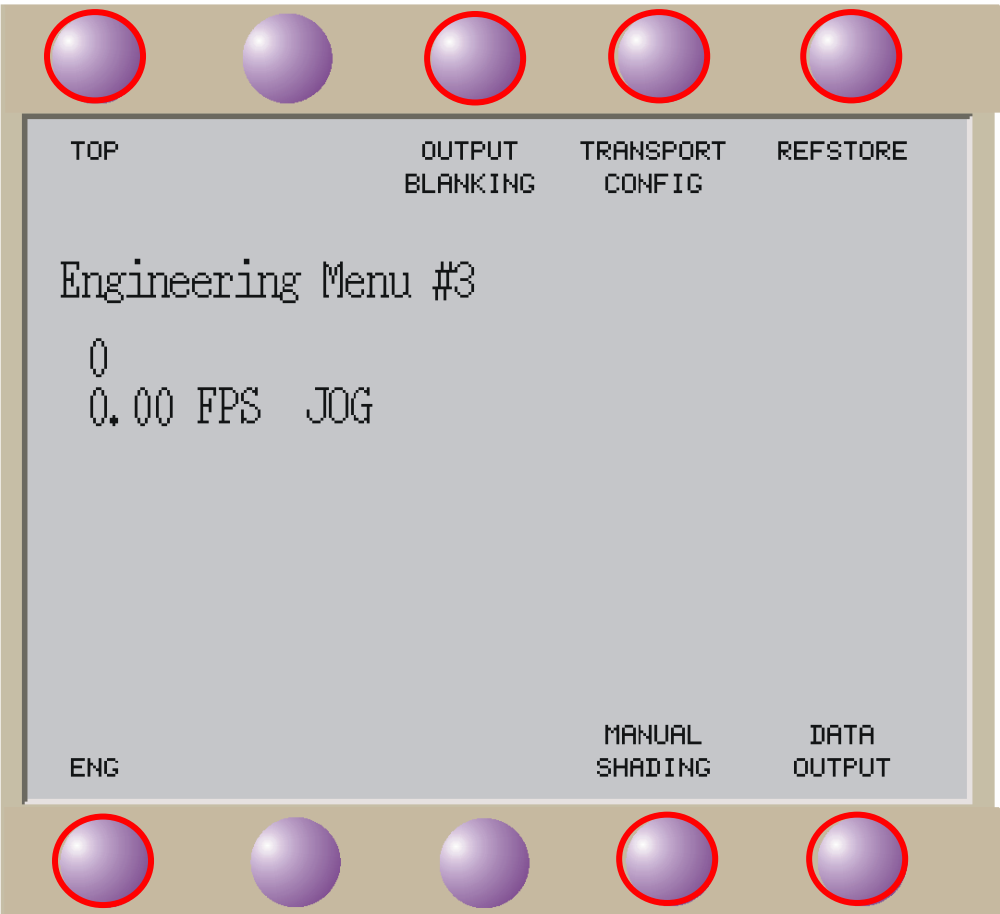
Fig 58 Engineering #3 Menu

Fig 59 Transport Configuration menu

* **NewsFlip**

Not Flipped

N/S Flipped

E/W Flipped

N/S E/W Flipped

UP

RESET

Output Blanking Menu

*E/W Flipped

1.33:1

** **Blanking Ratios**

1.33:1

1.55:1

1.66:1

1.77:1

1.85:1

2.35:1

2.39:1

NEWS
FLIP

PREVIOUS
RATIO

NEXT
RATIO

*   * *   * *
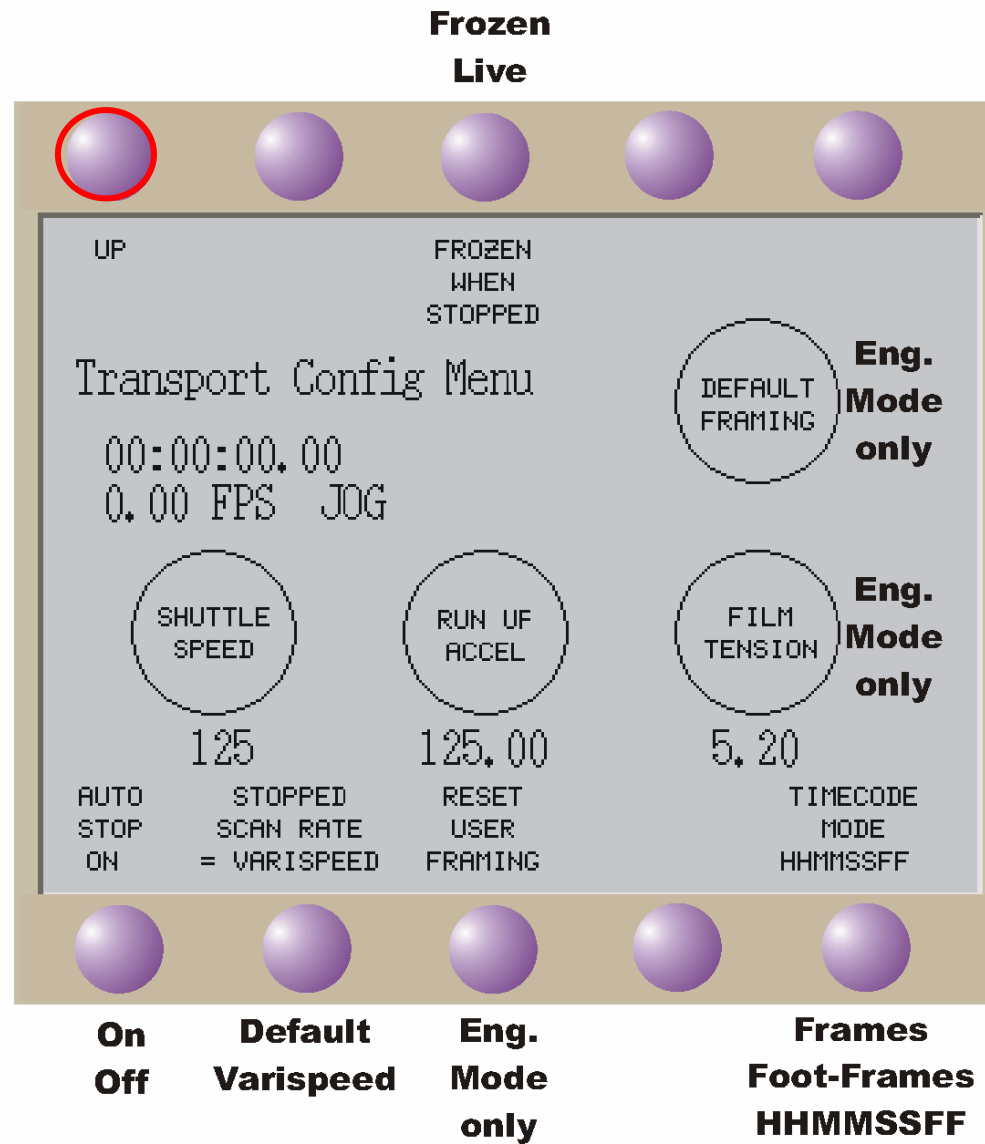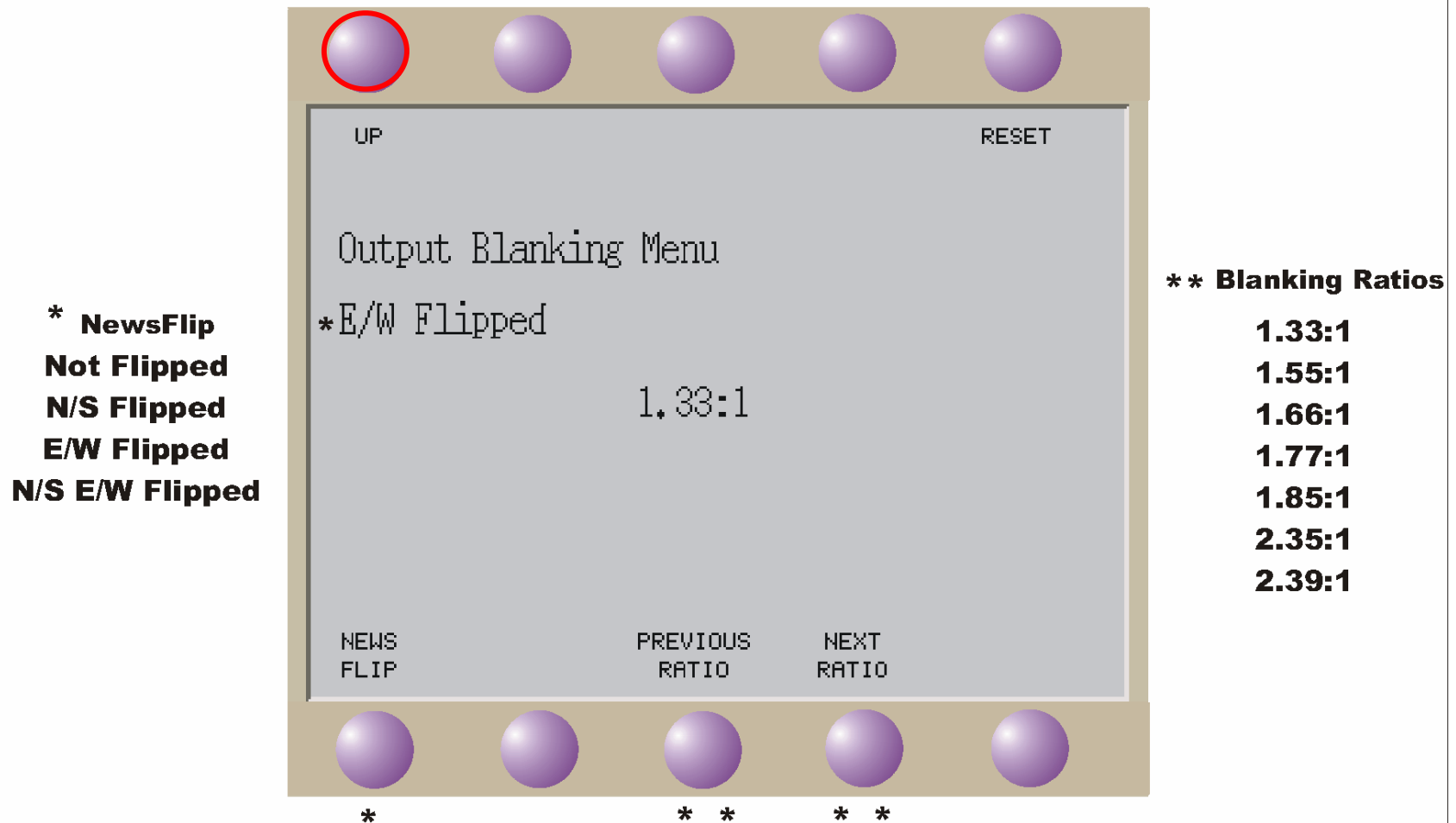
Fig 60 Output Blanking Menu
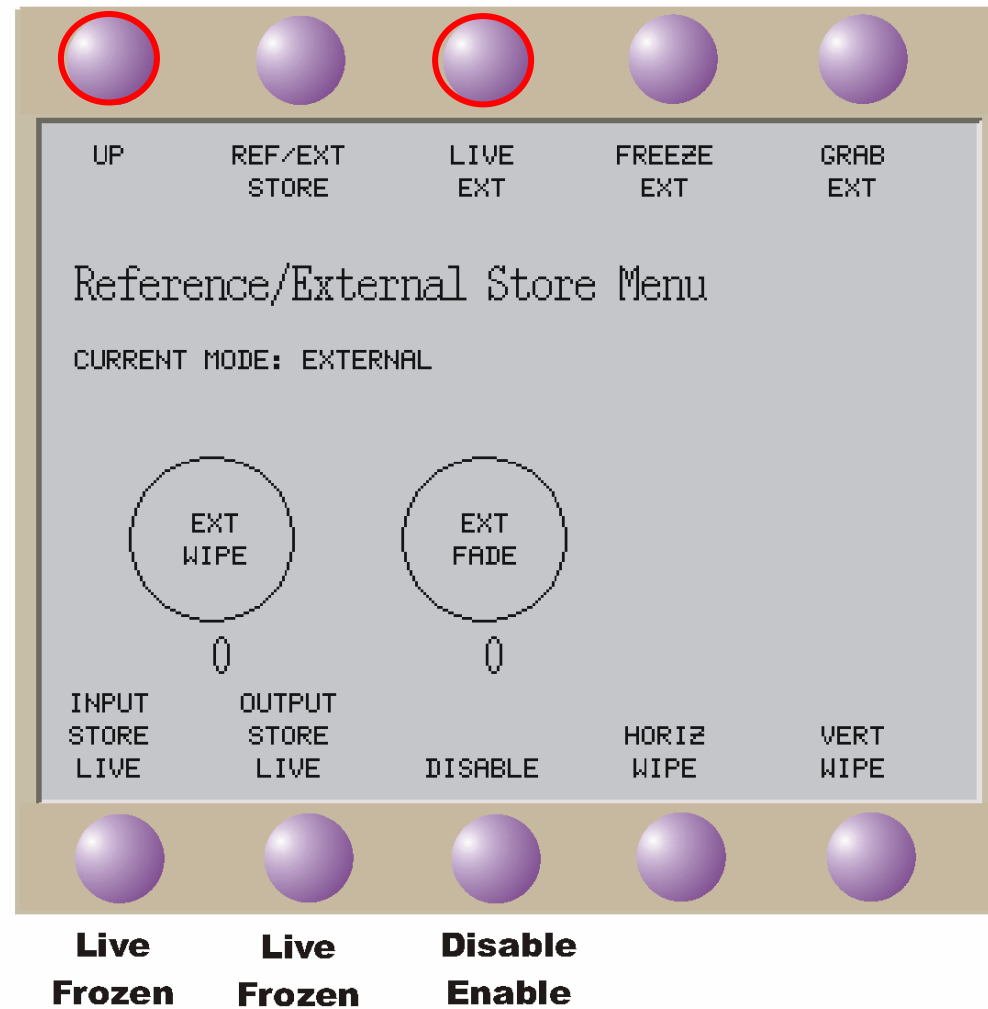
Fig 61 Reference Store External shown
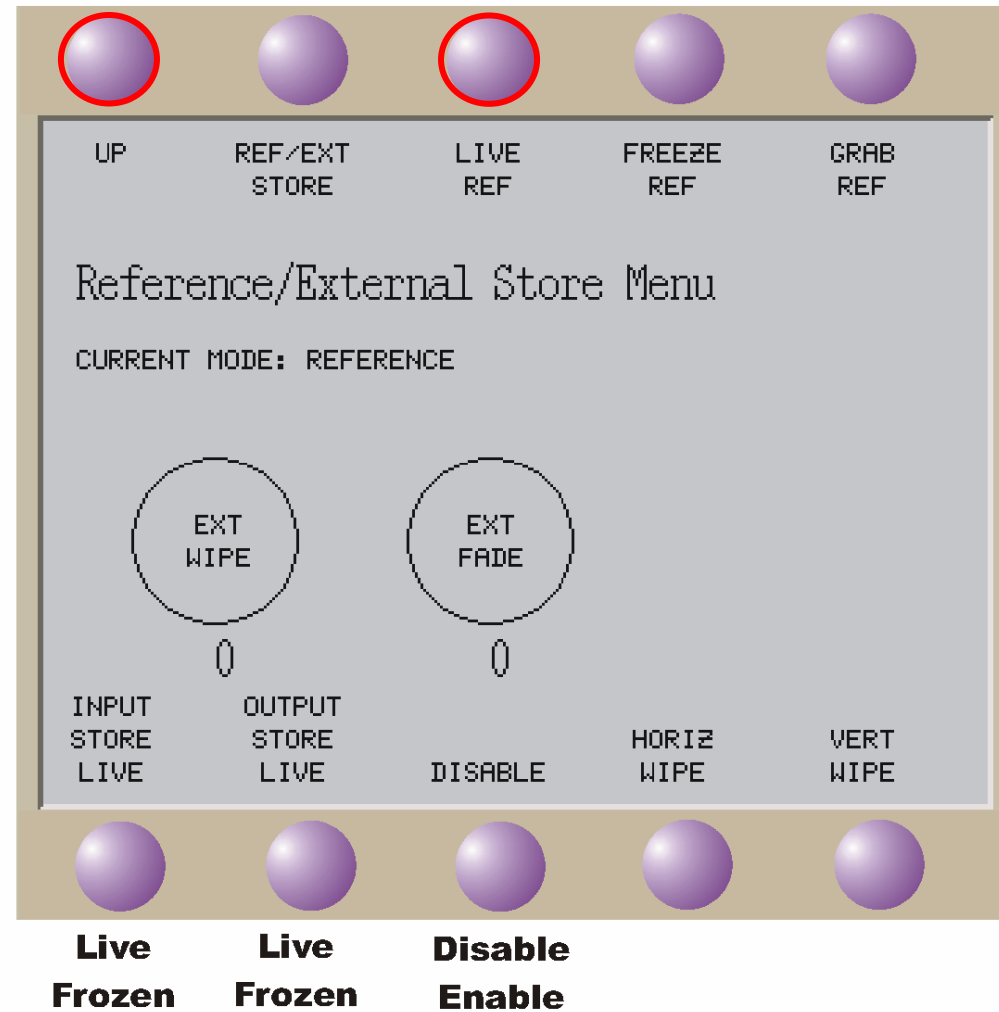
Fig 62 Reference Store Reference Shown

On
Off

UP   ZOOM   RESET
                      ROCK

Manual Shading Menu

SCRATCH

0

Linear

RED   GREEN   BLUE

0   0   0

MODE

*
*

*

Linear
Parabola

Engineering Mode
Linear x
Linear Y
Parabola X
Parabola Y
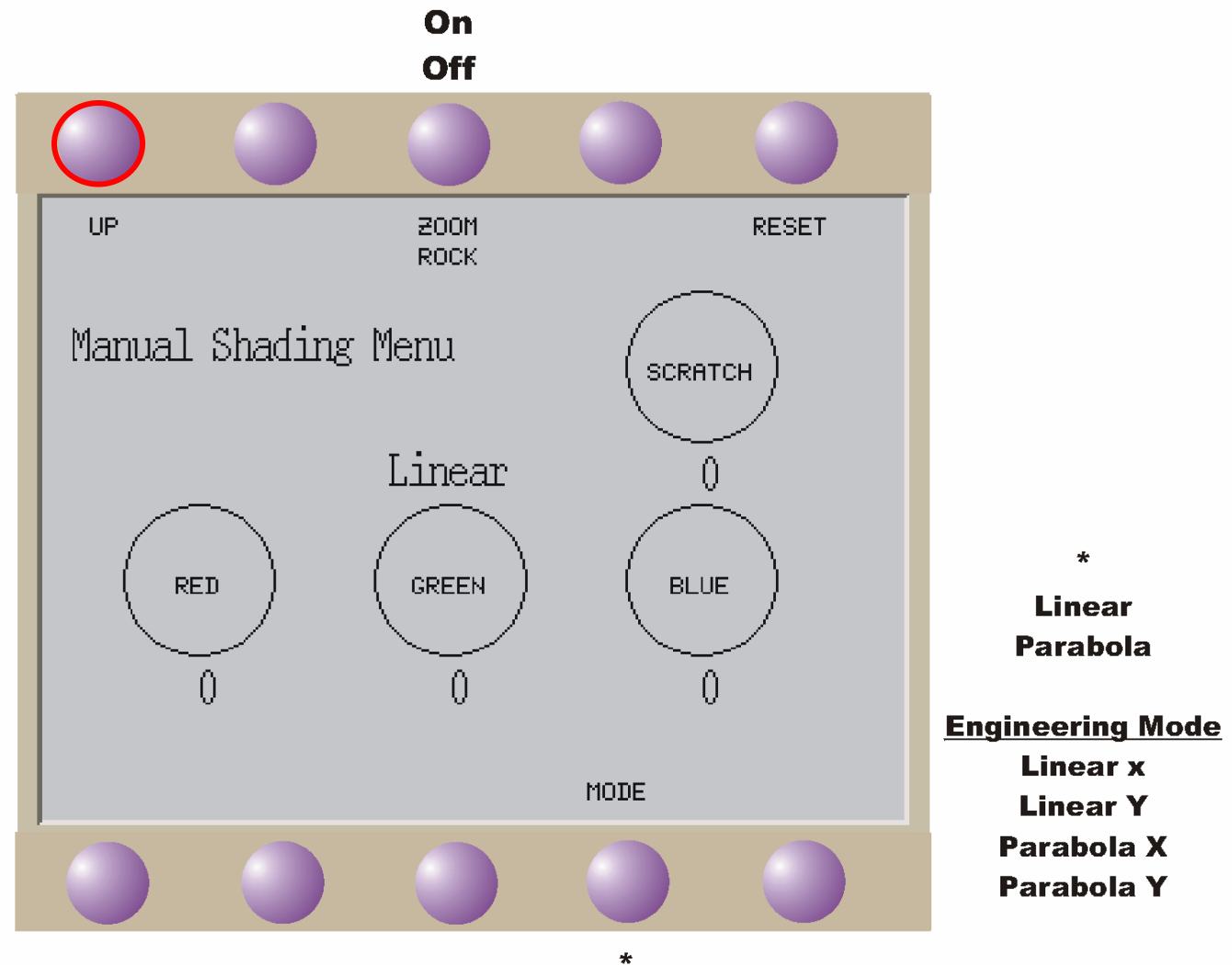
Fig 63 Manual Shading Menu
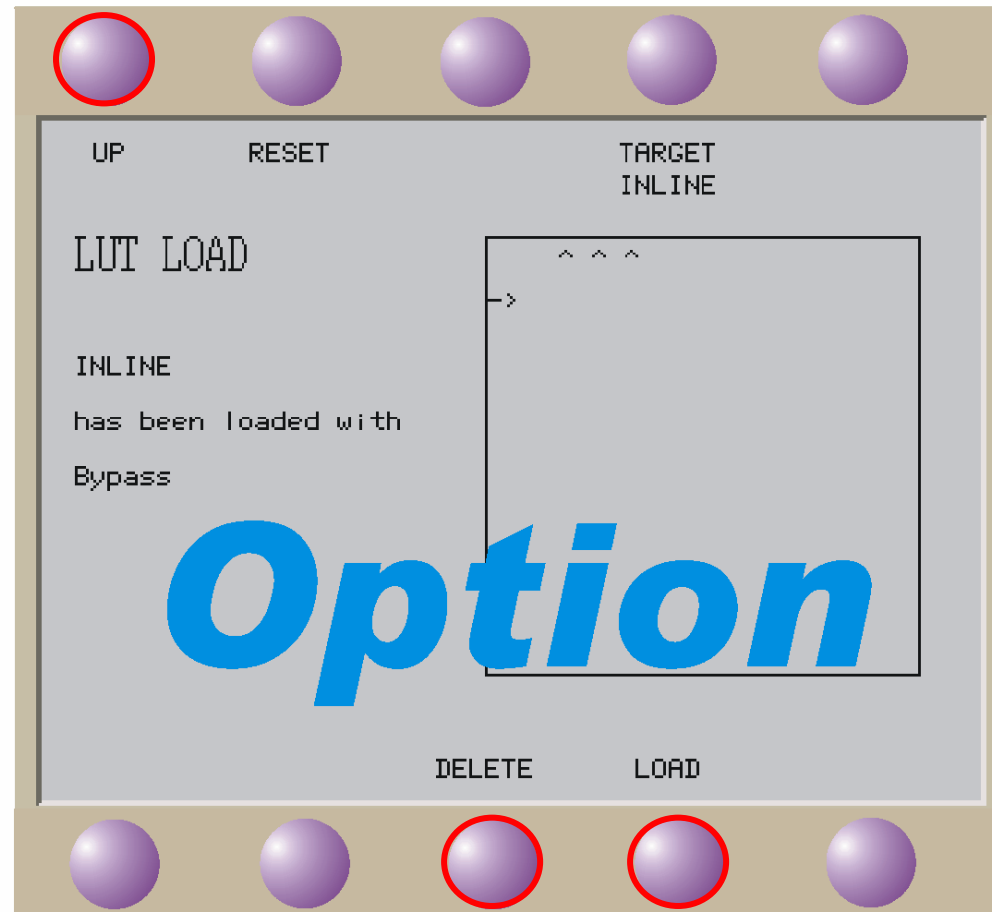
Fig 64 Data Output LUT Selection Menu
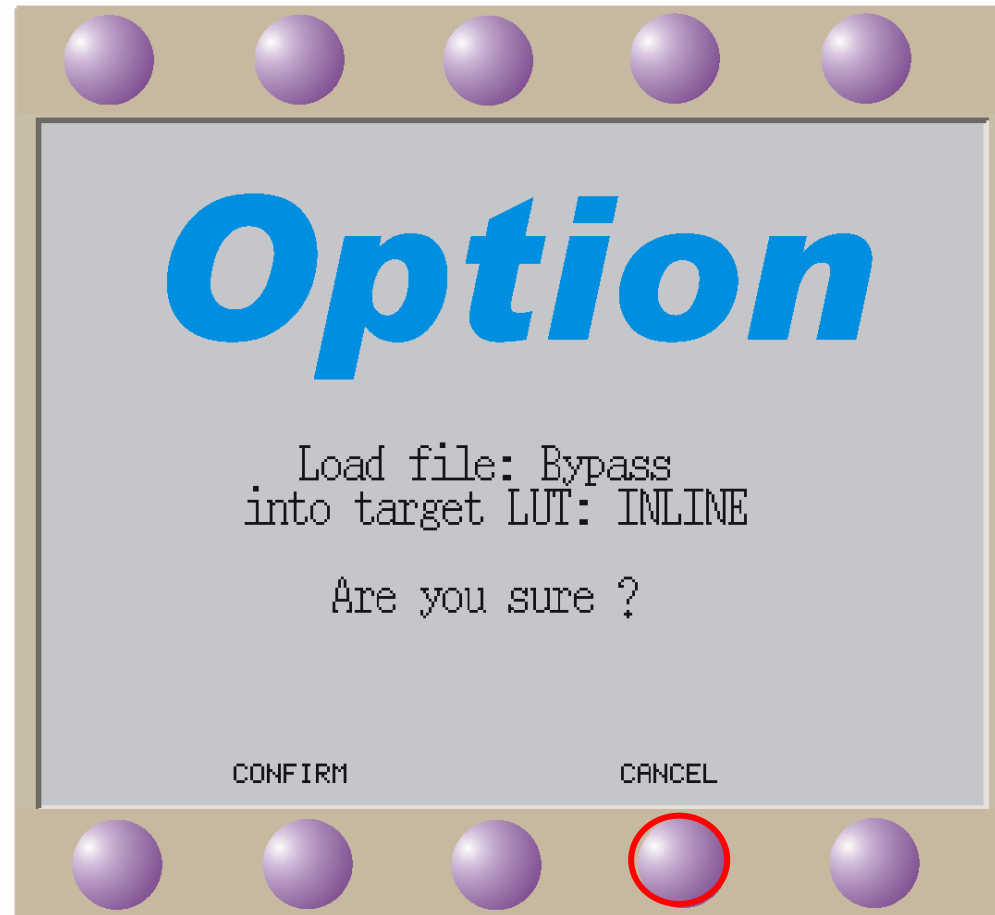
Fig 65 Data Output LUT File Load confirmation
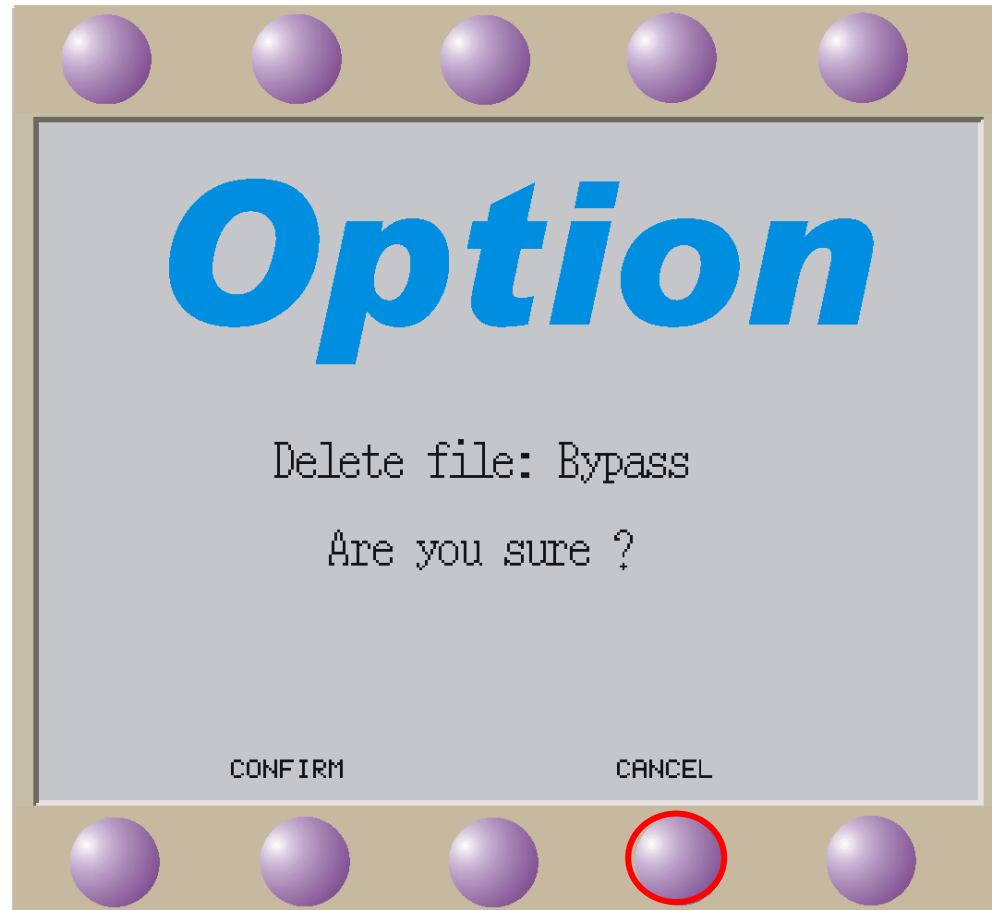
Fig 66 Data Output LUT File Delete confirmation
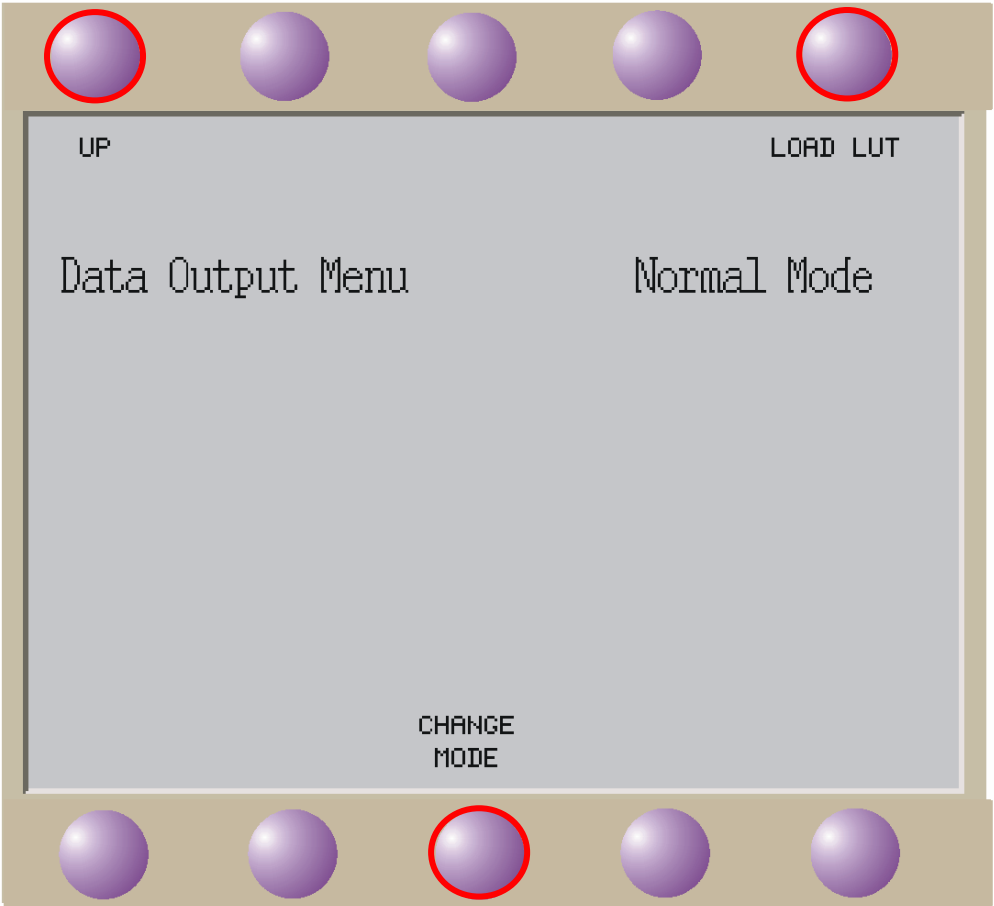
Fig 67 Data Output normal Mode
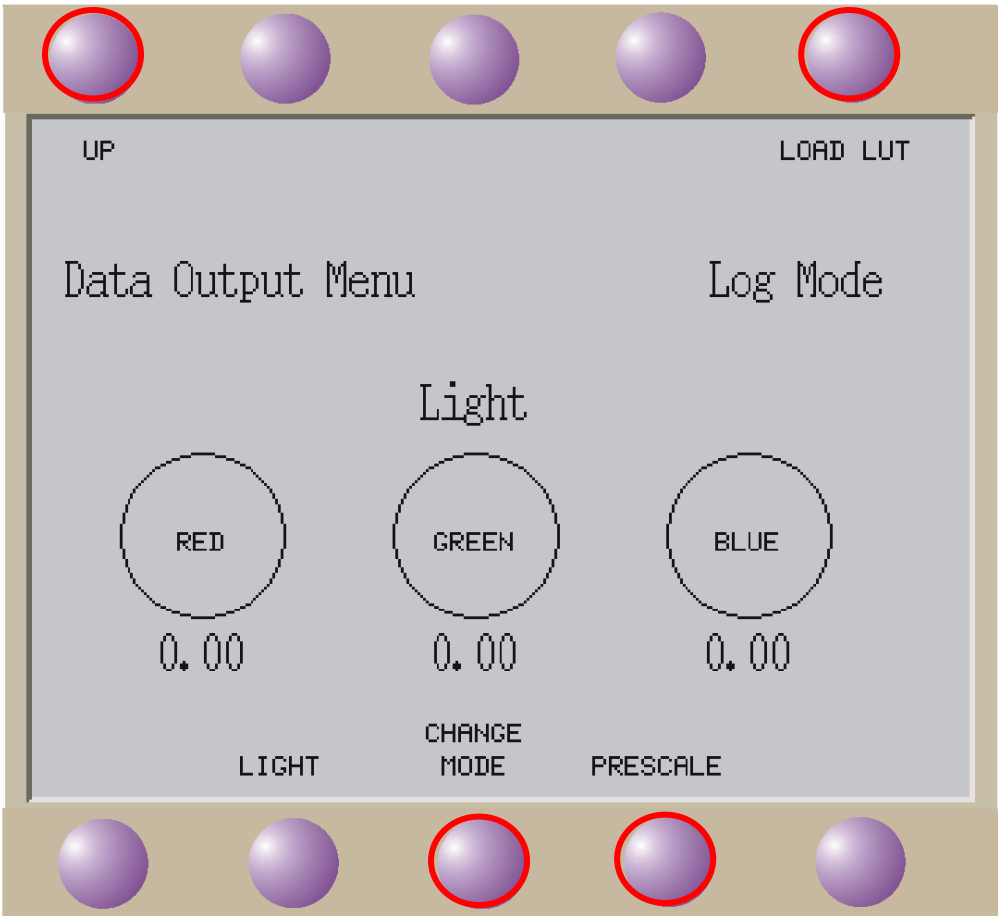
Fig 68 Data Output Light (Log Mode)

UP   LOAD LUT

Data Output Menu   Monitor Mode

Light

RED   GREEN   BLUE

0.00   0.00   0.00

                    CHANGE
        LIGHT   MODE   PRESCALE
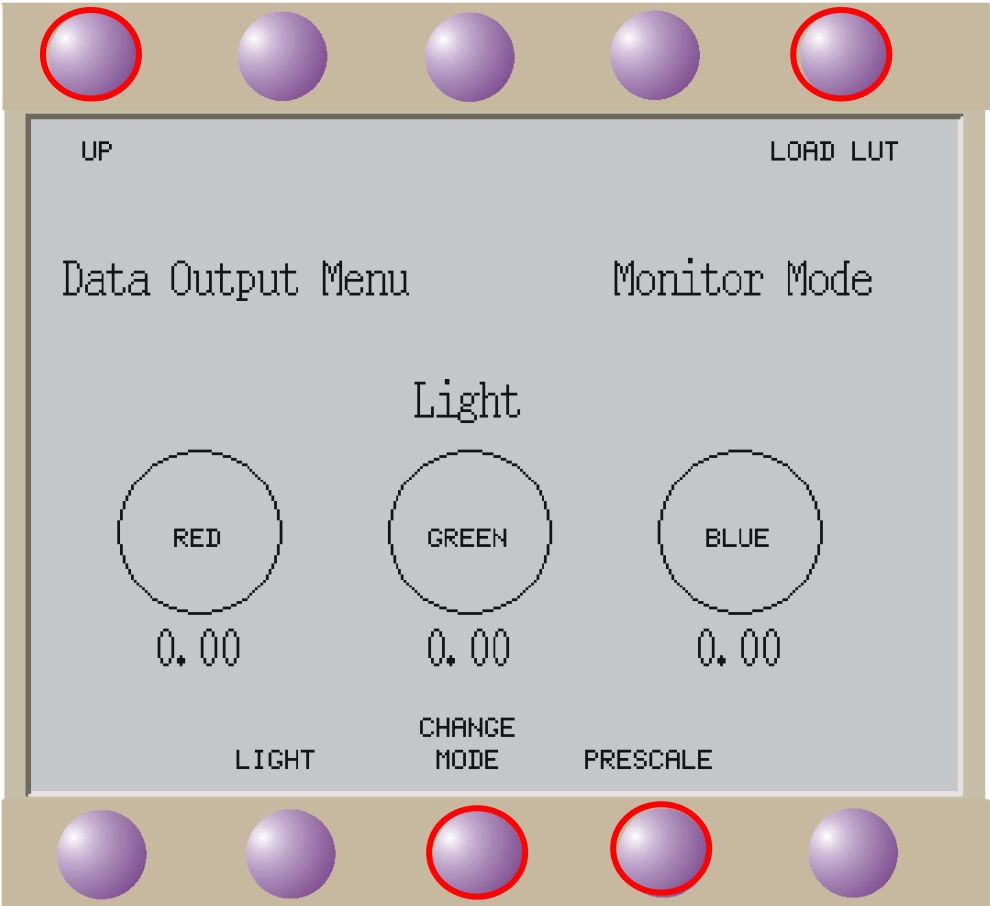
Fig 69 Data Output Light (Monitor Mode)
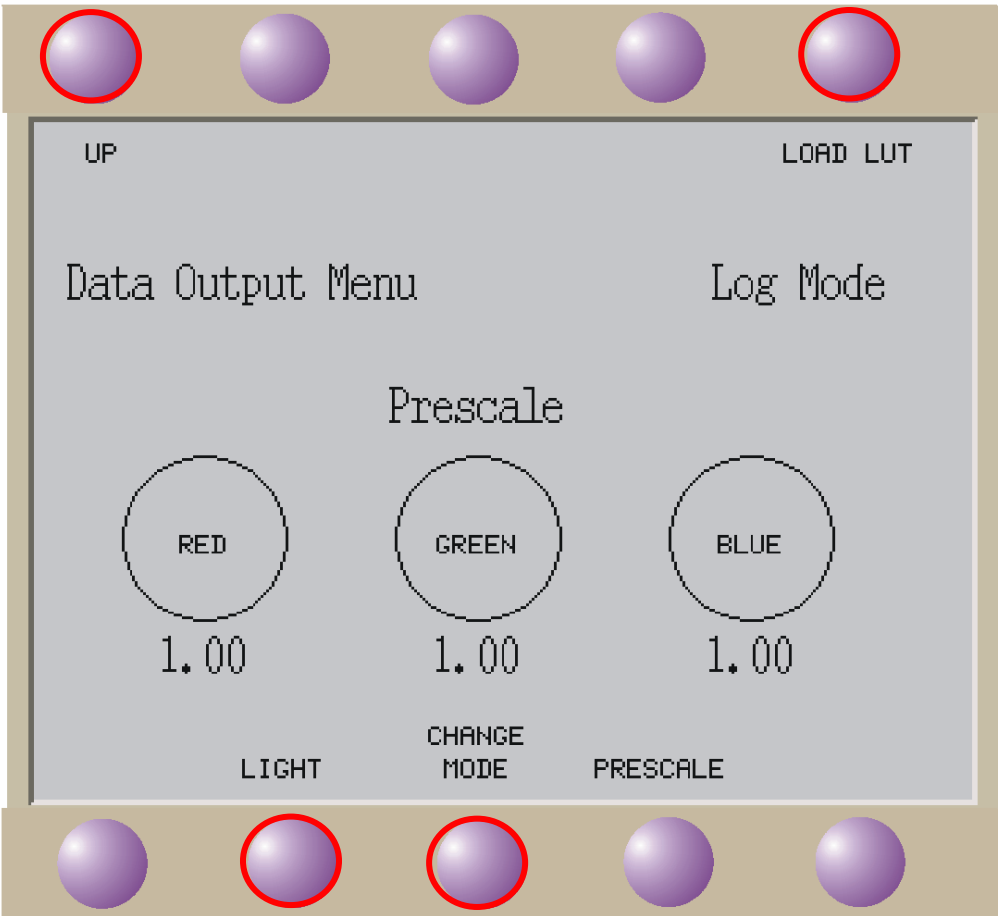
Fig 70 Data Output Prescale (Log Mode)
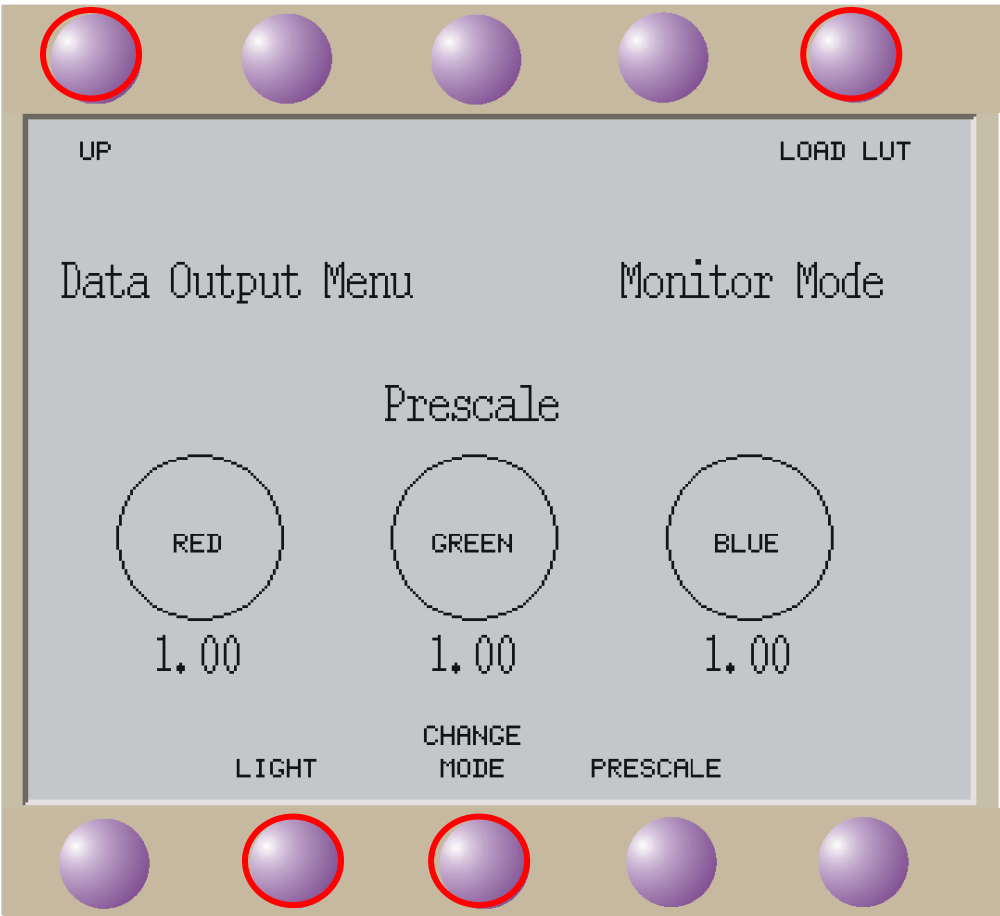
Fig 71 Data Output Prescale (Monitor Mode)
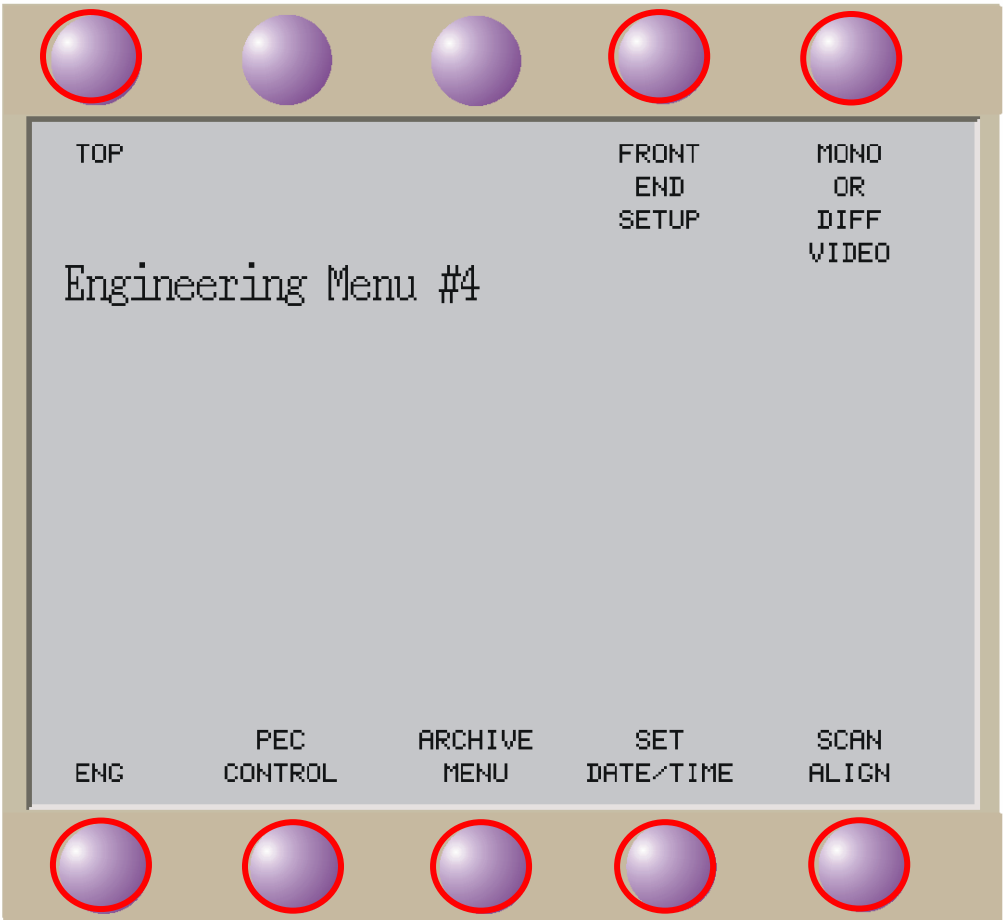
Fig 72 Engineering #4 Menu
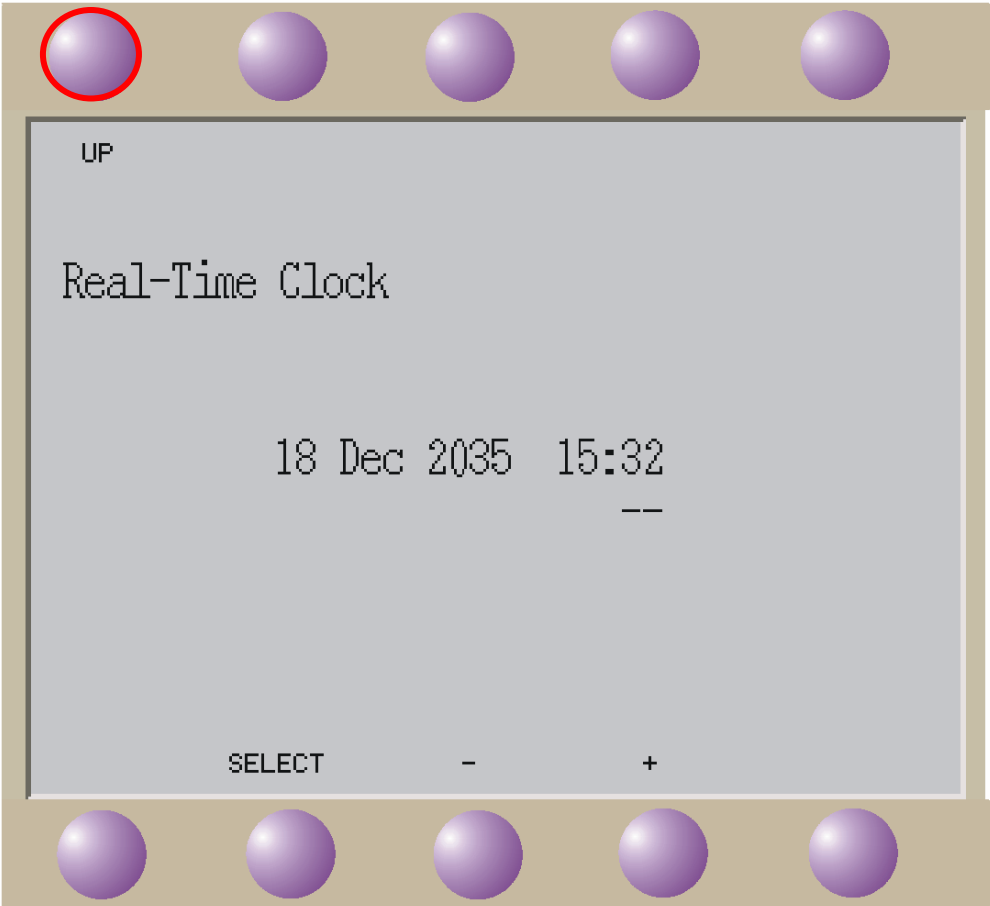
Fig 73 Real Time Clock Setup

Off

Wait

Ready

On

UP   EHT   RESET
            OFF

Front End Setup Menu

E/W   N/S   DEFOCUS
OFFSET   OFFSET

0   0   0

E/W   N/S   MODE
TOGGLE   TOGGLE   SELECT
DISABLE   DISABLE

Enable   Enable

Disable   Disable

Fig 74 Front End Setup Menu

Off

Wait

Ready

On

UP   EHT   RESET
            OFF

Front End Setup Menu

TUBE   TUBE   DEFOCUS
BLANK   BLANK
X   Y

0   0   0

BLANKING   MODE
DISABLE   SELECT

Enable

Disable
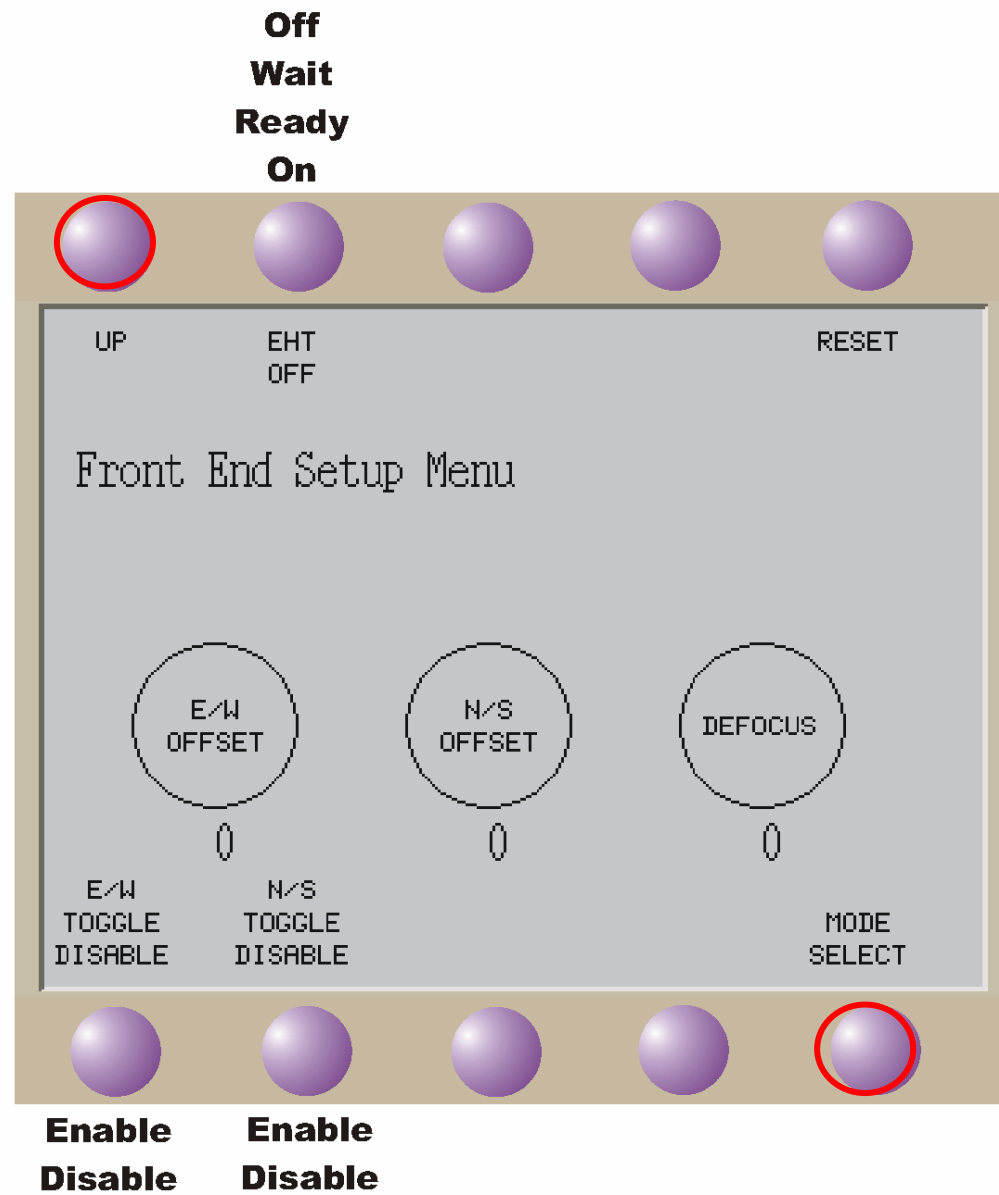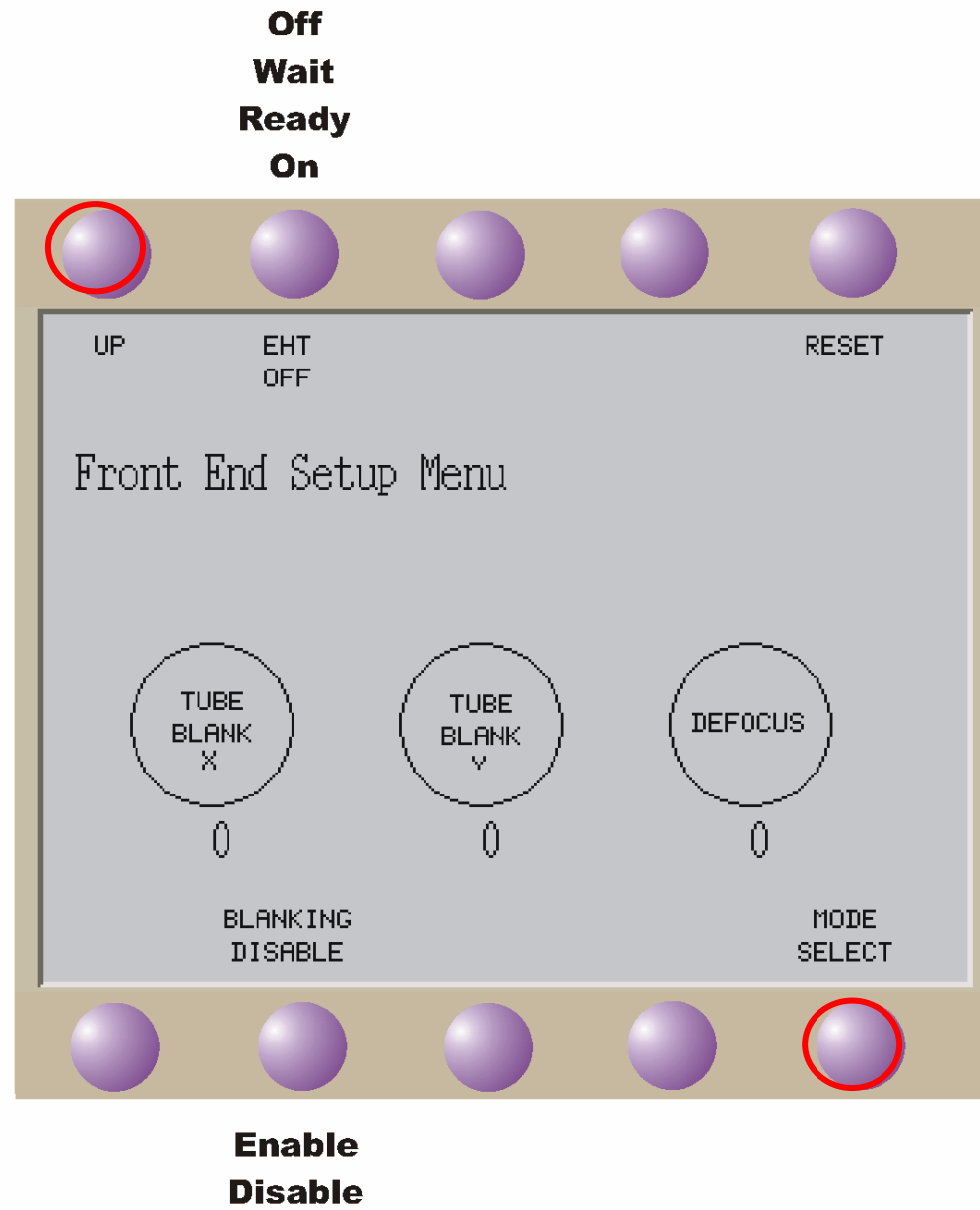
Fig 75 Front End Setup Blanking
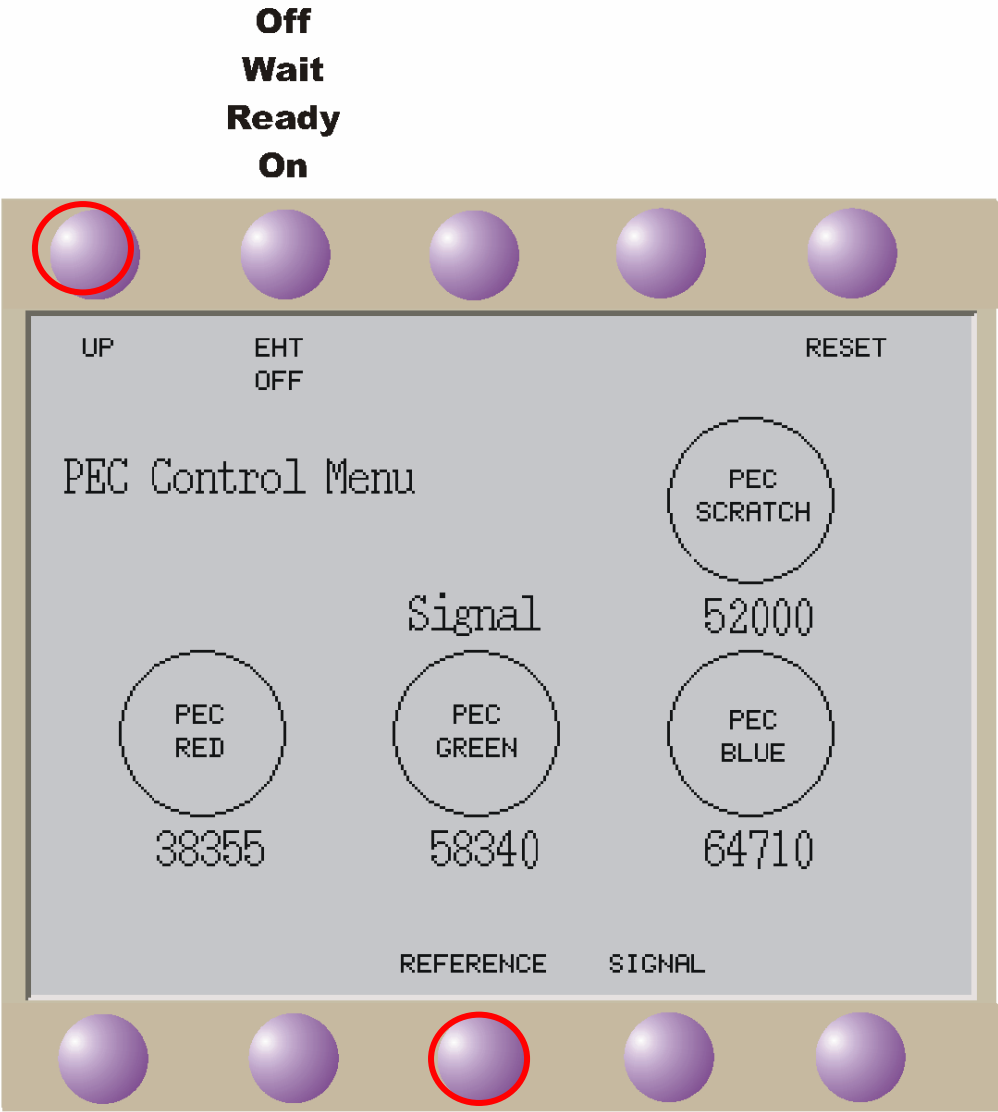
Fig 76 PEC Setup Main Signal

Off

Wait

Ready

On
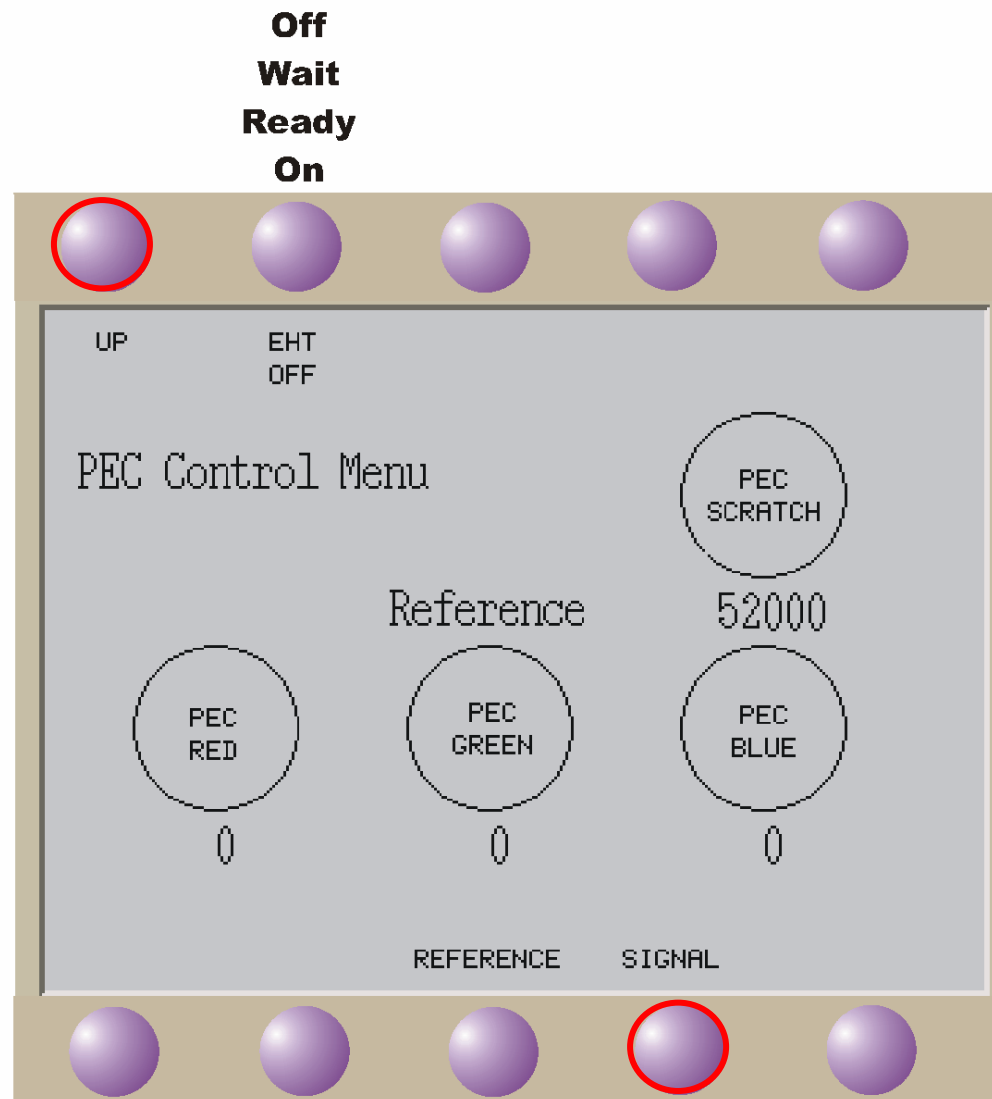
Fig 77 PEC Setup Reference Signal

UP   BACKUP   LOAD
          SCANALIGN   SCANALIGN
          DATA   DATA

Archive Menu

Fig 78 Archive Menu

Are you sure you want to install
scan align data to the hard drive?
Press OK only if you are sure you
want to overwrite the current data

OK   CANCEL

Fig 79 Archive Load

Back up scan alignment data

Are You Sure?

OK   CANCEL

Fig 80 Archive Save

UP
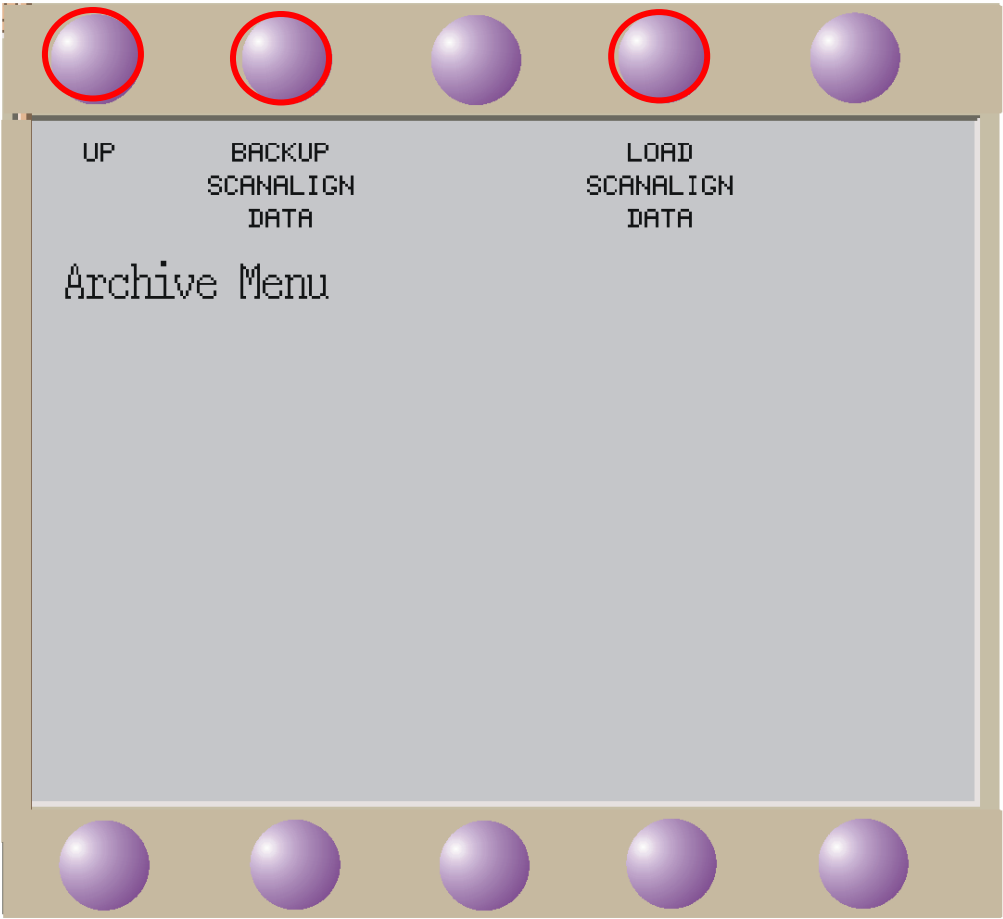
Normal Video
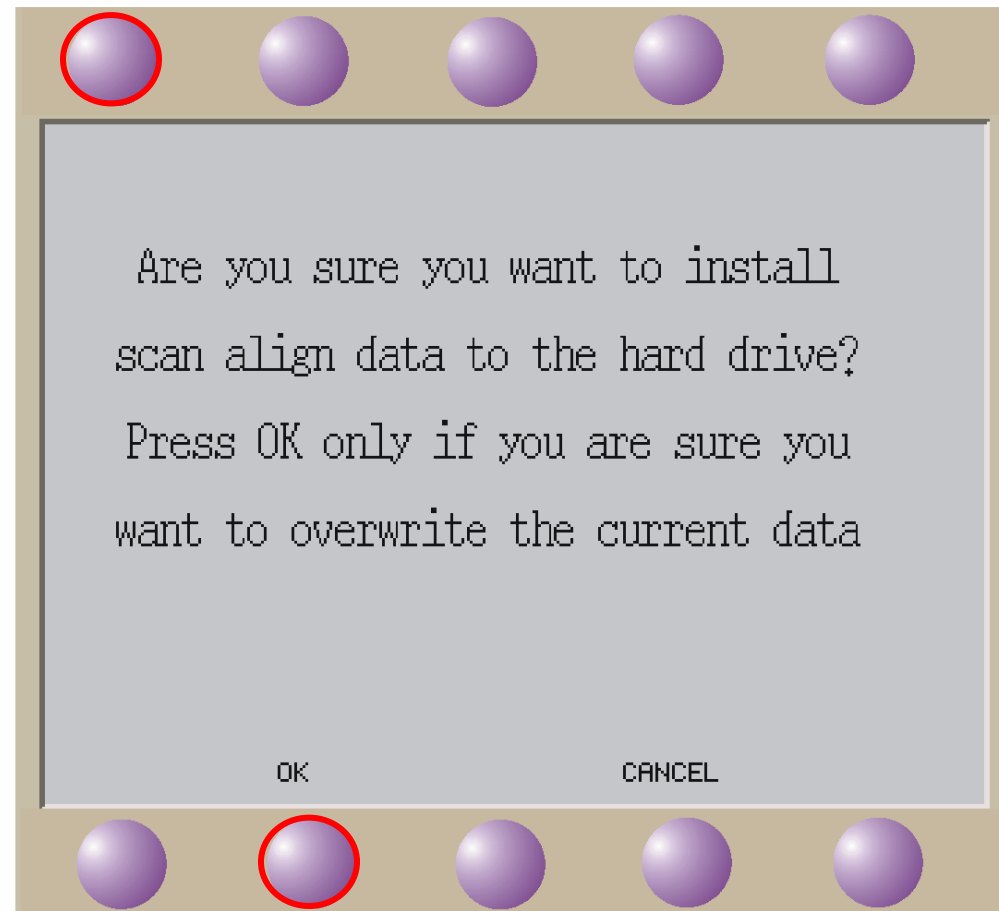
SINGLE   DIFFERENTIAL
MAIN/REF   MAIN/REF   NORMAL
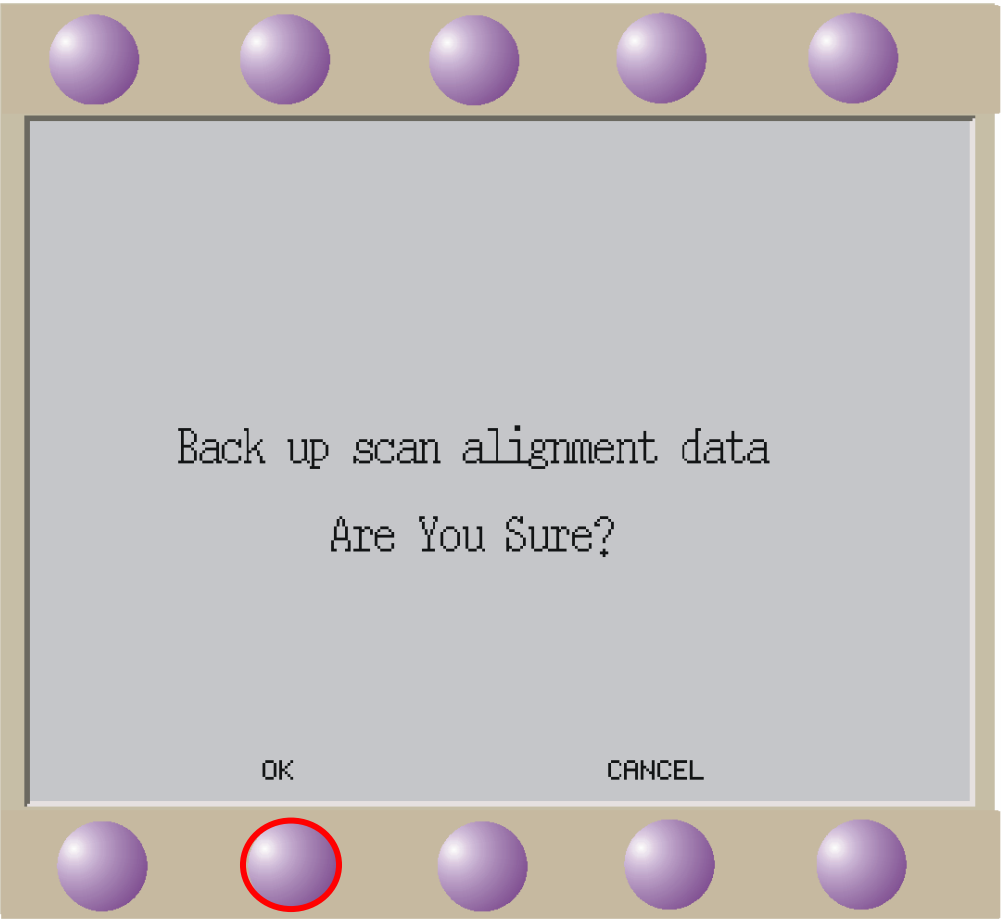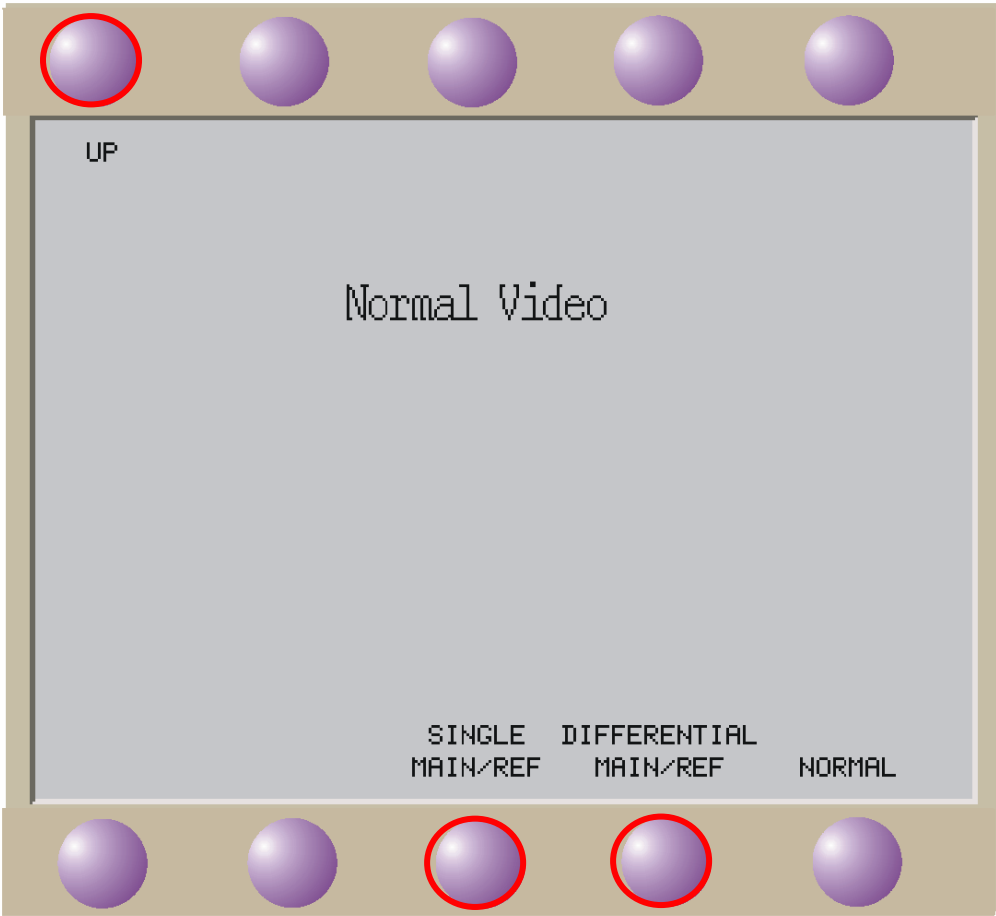
Fig 81 Mono / Differential Video Normal
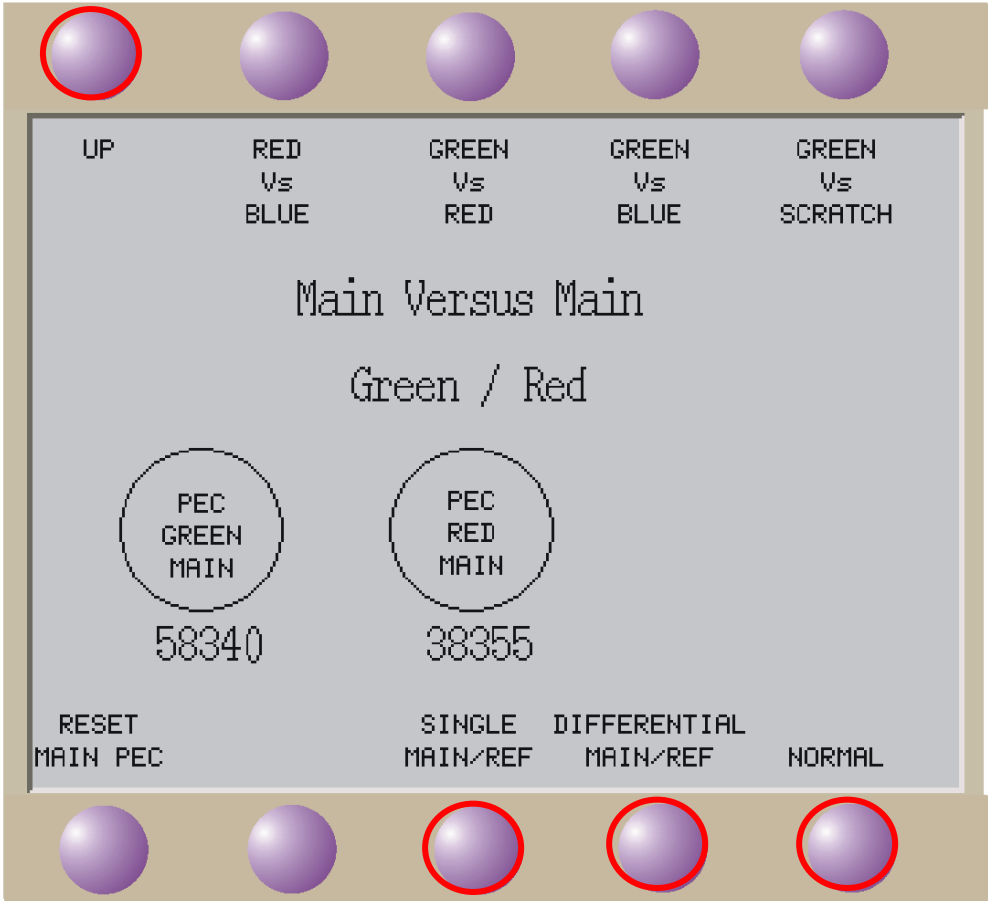
Fig 82 Mono / Differential Video Main vs Main
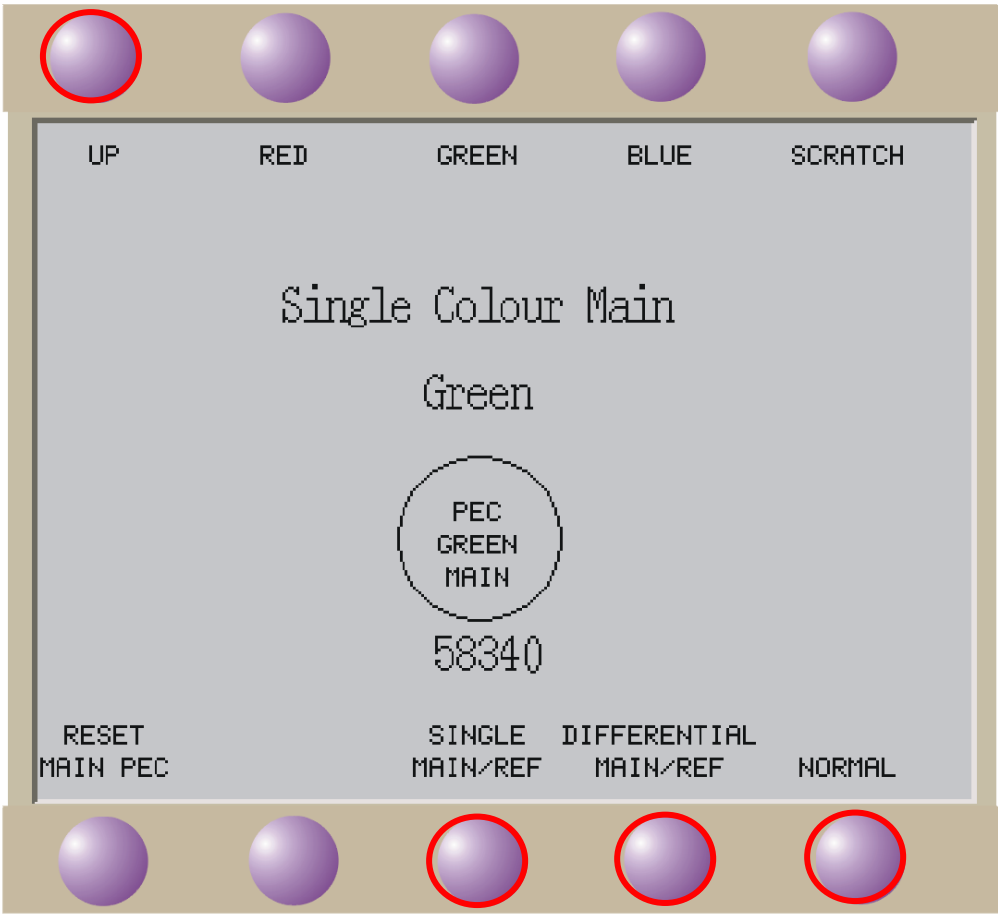
Fig 83 Mono / Differential Video Colour Main
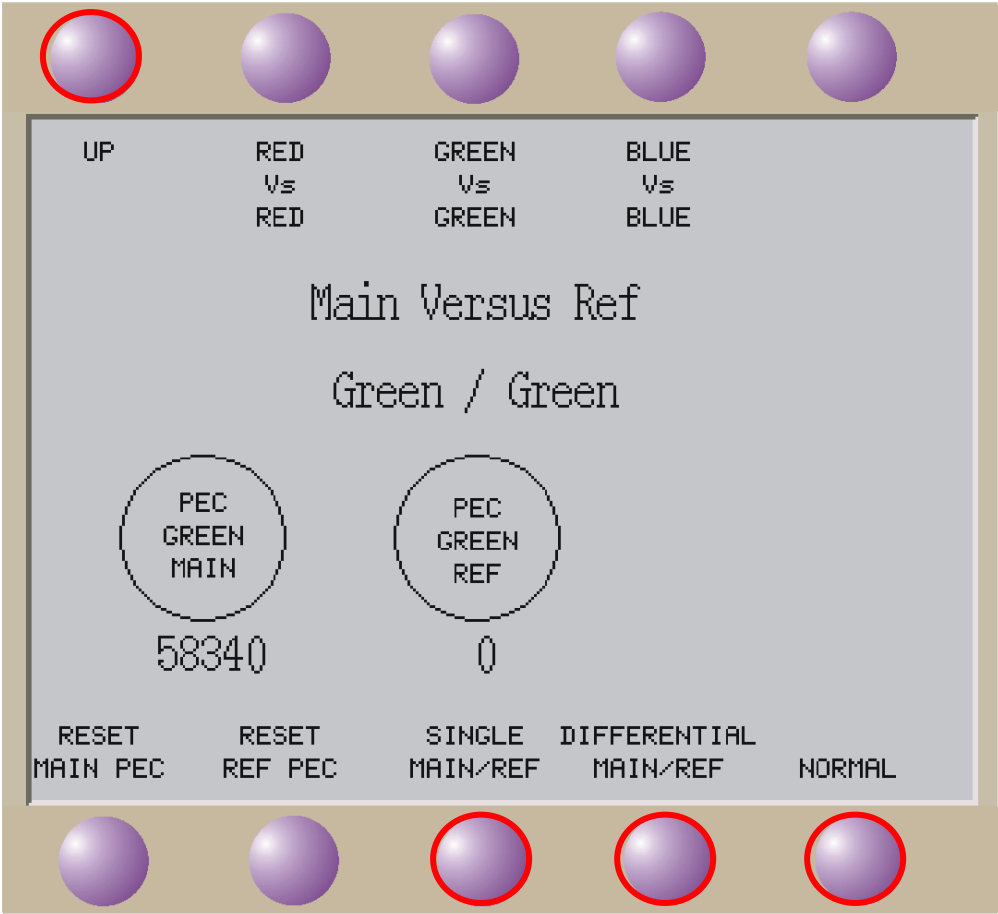
Fig 84 Mono / Differential Video   Main vs Ref
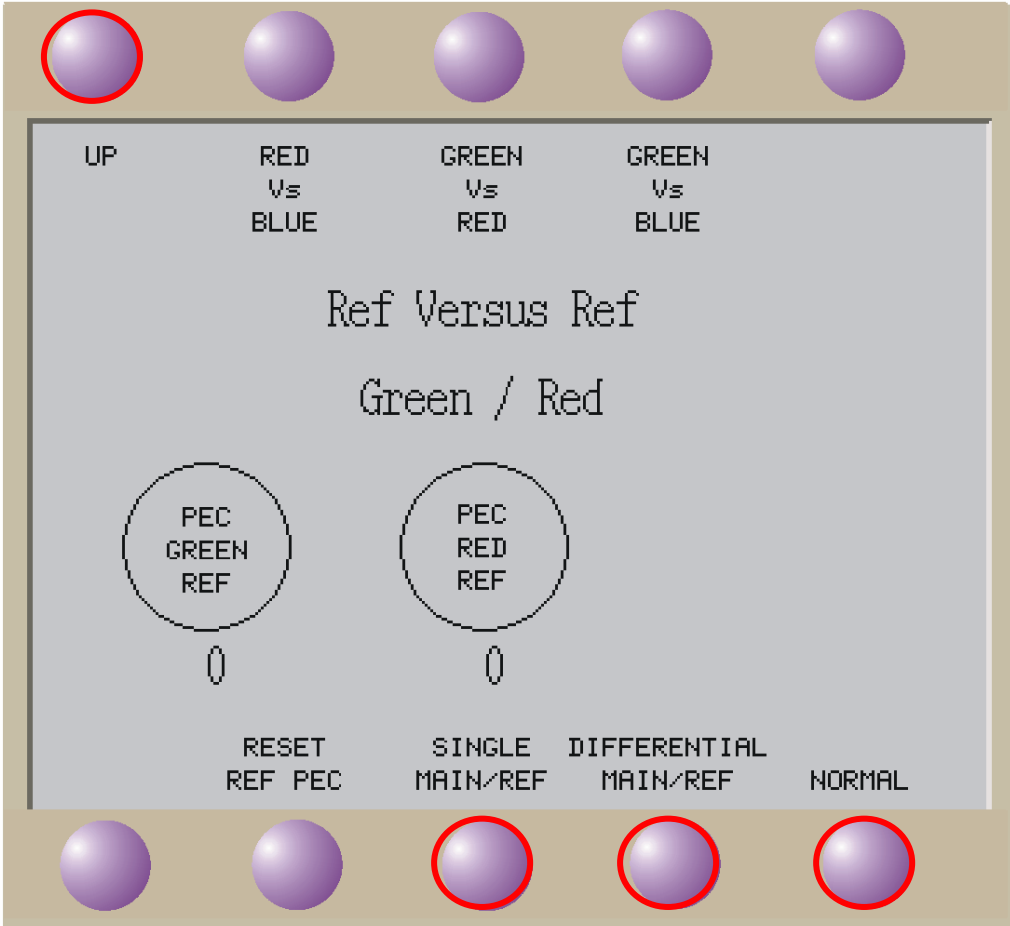
Fig 85 Mono / Differential Video Ref vs Ref
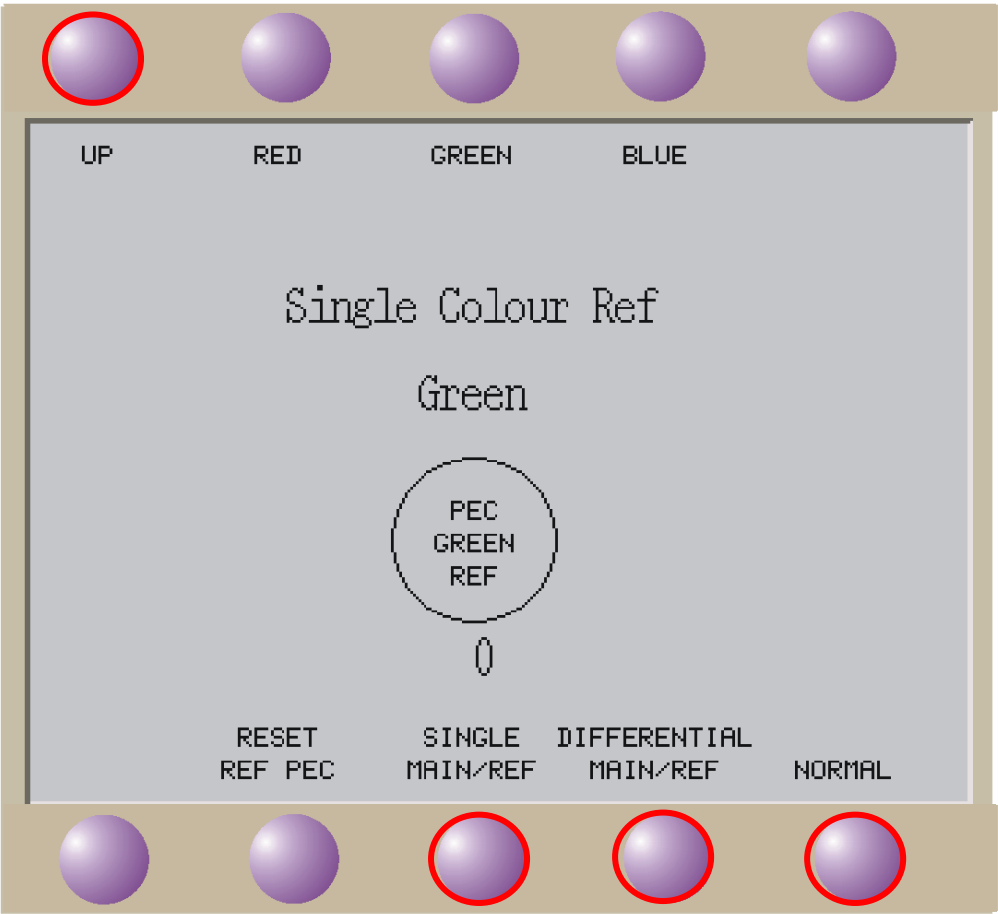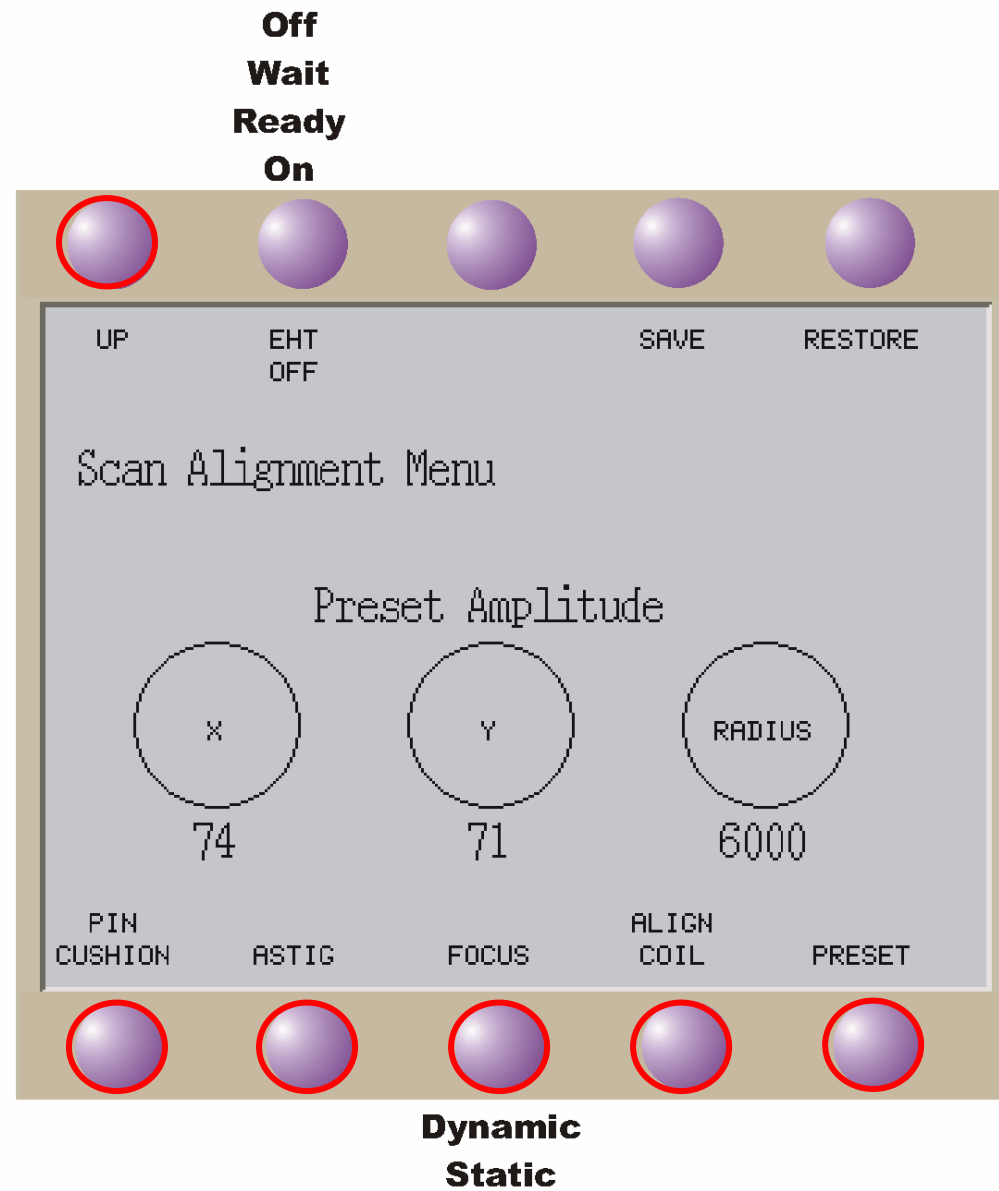
Fig 86 Mono / Differential Video   Colour Ref

Off

Wait

Ready

On

UP   EHT   SAVE   RESTORE
                      OFF

Scan Alignment Menu

Preset Amplitude

X   Y   RADIUS

74   71   6000

PIN   ALIGN
CUSHION   ASTIG   FOCUS   COIL   PRESET

Dynamic

Static

Fig 87 Scan Align Amplitude
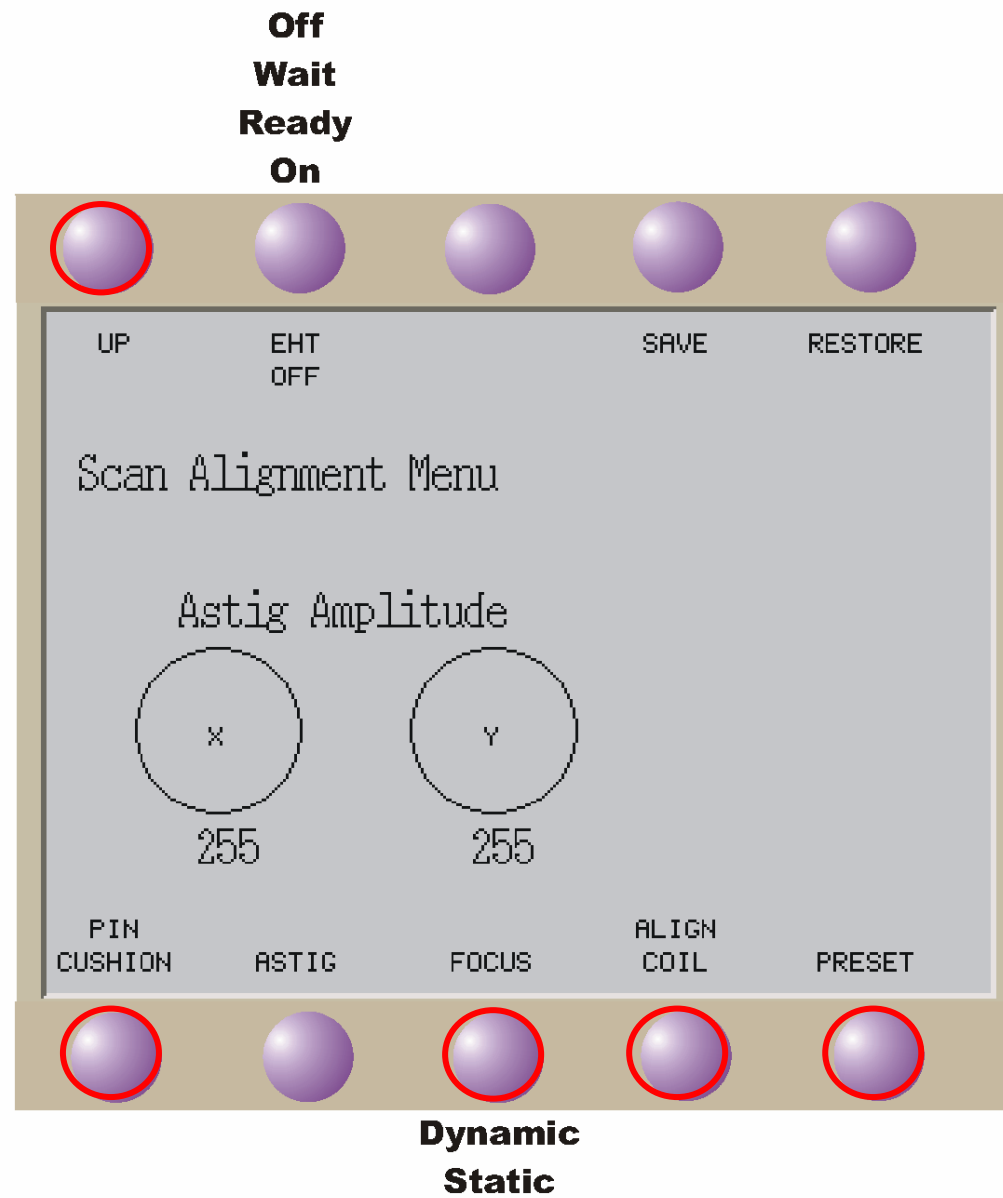
Fig 88 Scan Align Astig

Fig 89 Scan Align Coils

Off

Wait

Ready

On

UP   EHT   AUTO   SAVE   RESTORE
            OFF   FOCUS

Scan Alignment Menu

Dynamic Focus

CENTRE   OFFSET   OFFSET
                X   Y

255   0   0

PIN   ALIGN
CUSHION   ASTIG   FOCUS   COIL   PRESET
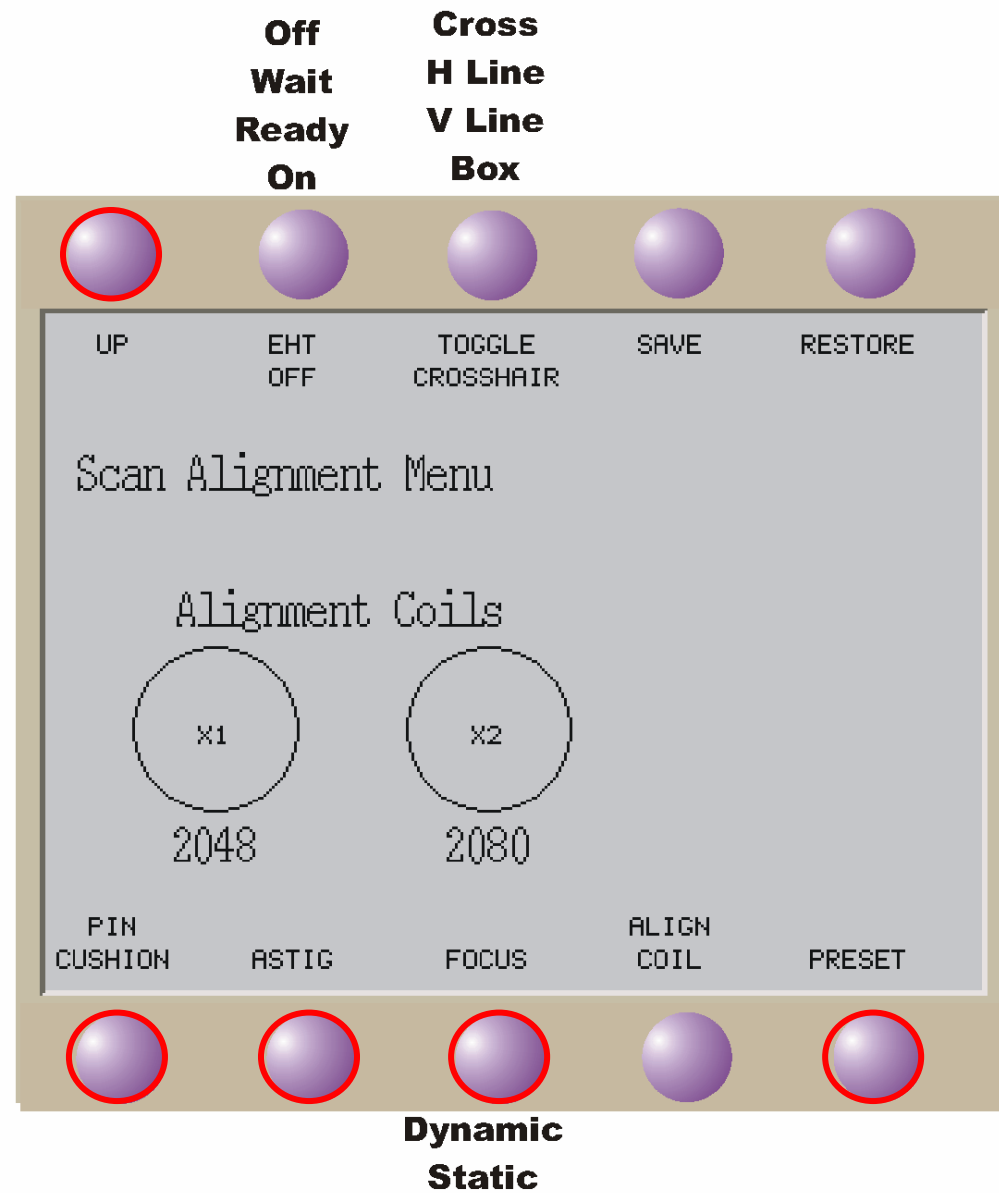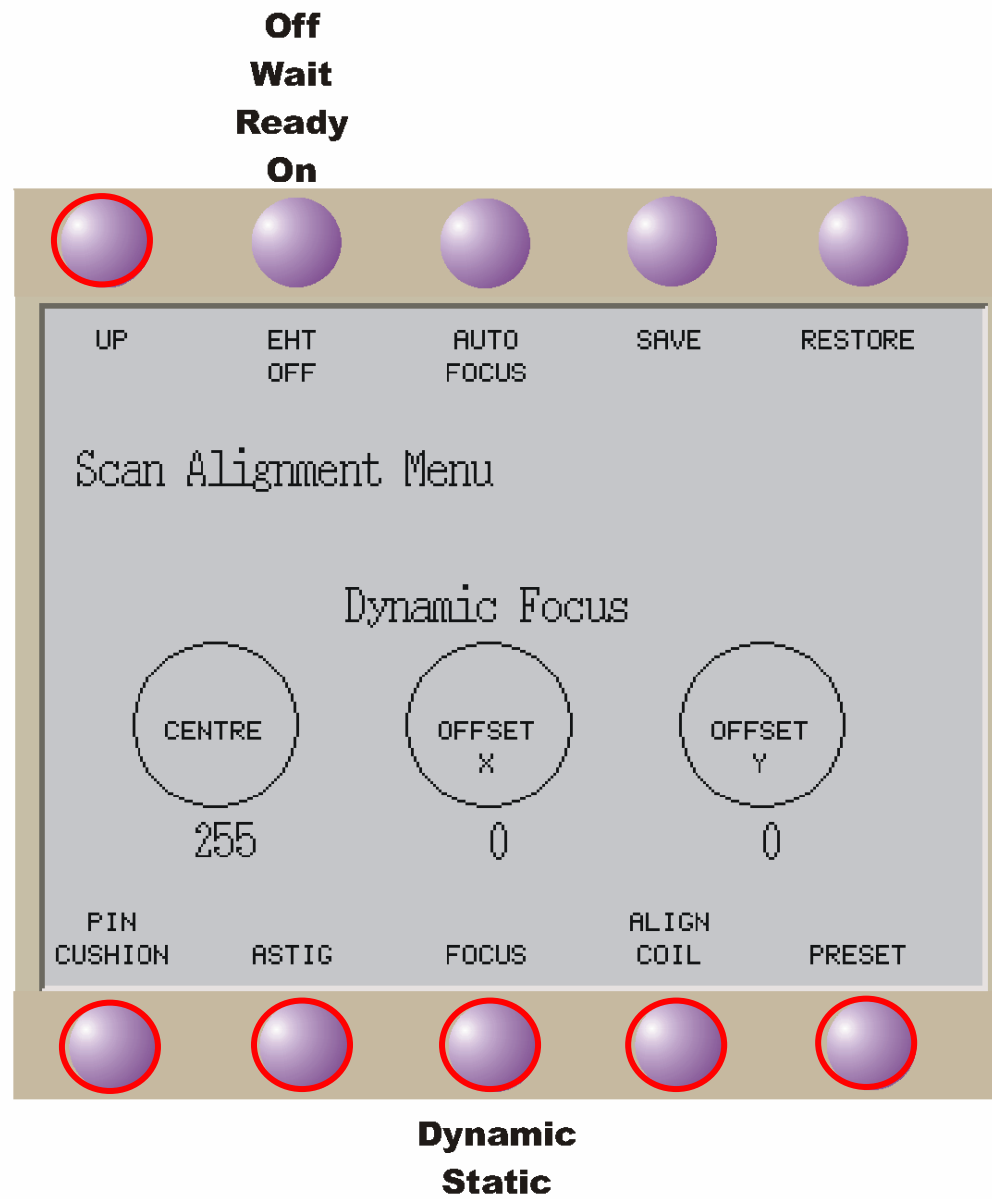
Dynamic

Static

Fig 90 Scan Align Dynamic Focus

Off

Wait

Ready

On

UP   EHT   SAVE   RESTORE
            OFF

Scan Alignment Menu

Preset Flyback

FLYBACK
TRIM

0

PIN   ALIGN
CUSHION   ASTIG   FOCUS   COIL   PRESET

Dynamic
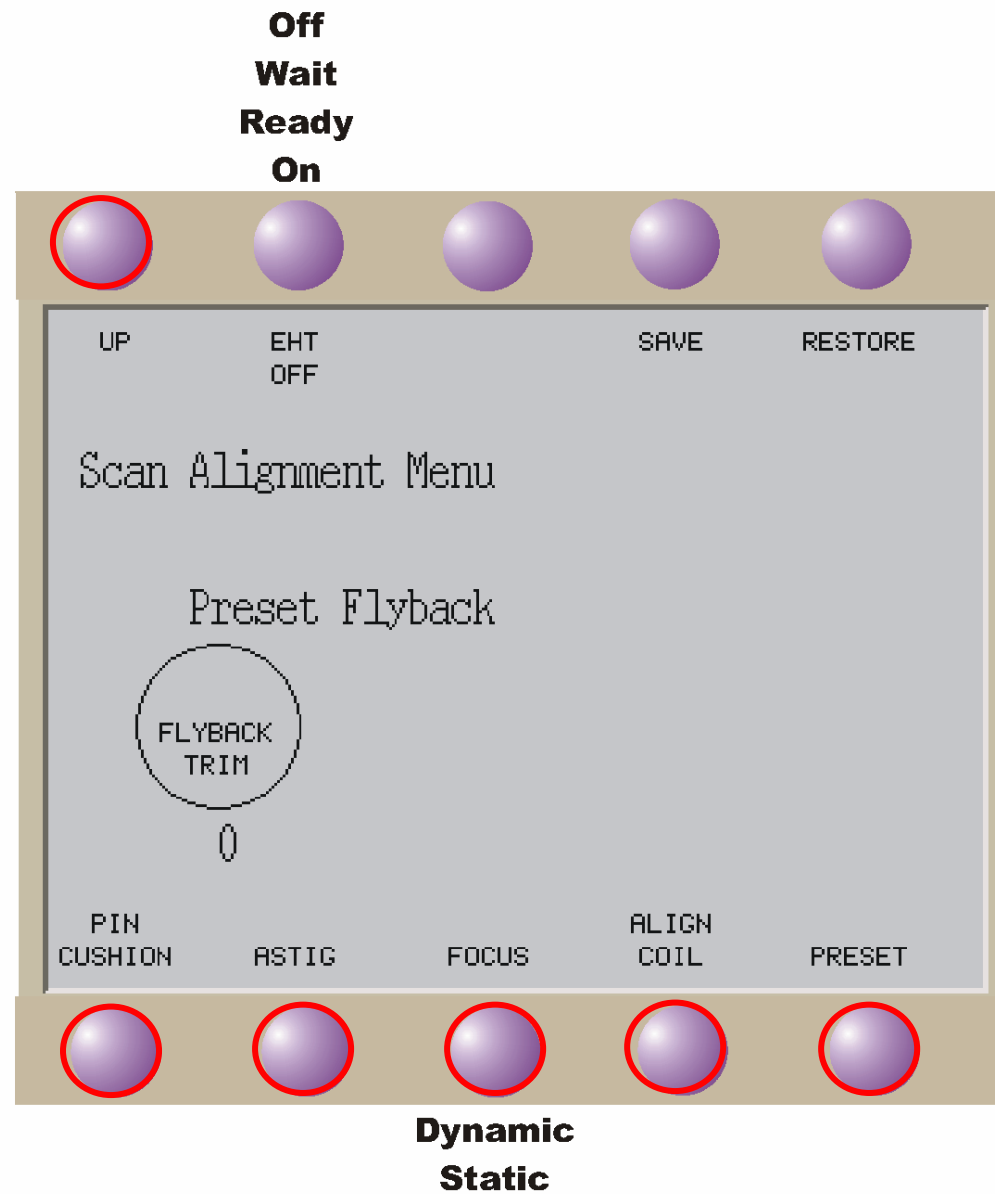
Static

Fig 91 Scan Align Preset Fly back

Off

Wait

Ready

On

UP   EHT   SAVE   RESTORE
            OFF

Scan Alignment Menu

Preset Offset

X   Y

111   130

PIN   ALIGN
CUSHION   ASTIG   FOCUS   COIL   PRESET

Dynamic

Static

Fig 92 Scan Align Offset

Off

Wait

Ready

On

UP   EHT   SAVE   RESTORE
            OFF

Scan Alignment Menu

Pincushion

X   Y   TUBE
                             LENGTH

0   0   11700

PIN   ALIGN
CUSHION   ASTIG   FOCUS   COIL   PRESET

Dynamic

Static

Fig 93 Scan Align Pincushion

Off

Wait

Ready

On

UP   EHT   SAVE   RESTORE
            OFF

Scan Alignment Menu

Preset Skew

X   Y

-180   82

PIN   ALIGN
CUSHION   ASTIG   FOCUS   COIL   PRESET

Dynamic

Static

Fig 94 Scan Align Skew

Off

Wait

Ready

On

Fig 95 Scan Align Static Focus

Deck Plate

The Deck Plate (shown in Figure 96) provides controls that are associated with film lacing and are only accessible when the film transport door is open.
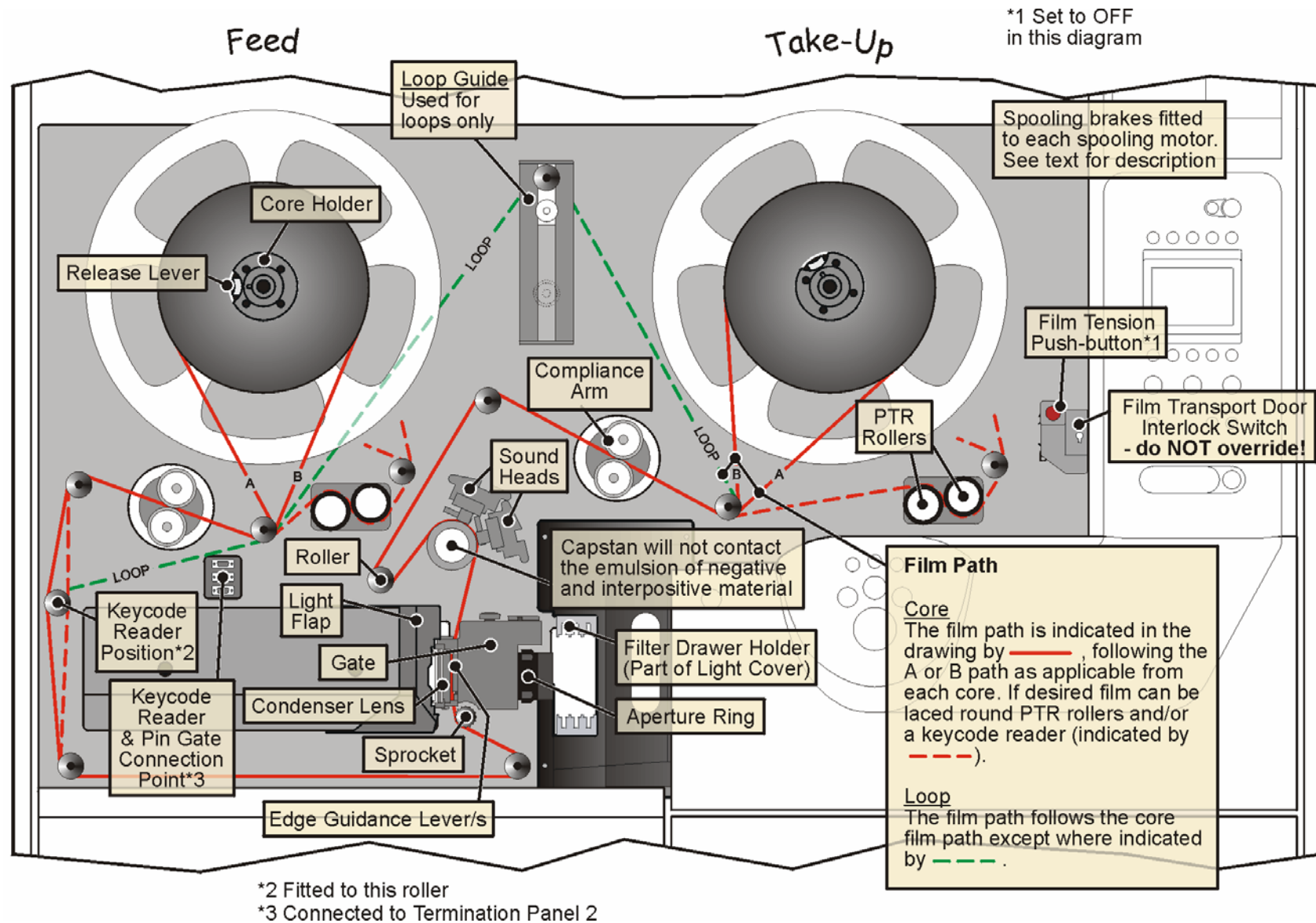
Figure 96 Deck Plate Controls

⚠️**Warning**

Ensure that film tension is switched OFF (film tension push-button extinguished) BEFORE touching any part of the film transport mechanism.

Controls

🔴 Film Tension Push-button

Press the *Film Tension Push-button* to apply (or remove) tension to the film by applying (or removing) power to the spooling and compliance arm motors. The lamp in this push-button indicates the following status and actions. See Table I.

Table I Indications Given By Film Tension Push-button Lamp

🔴 Tension OFF – the compliance arms are in the film lacing/unlacing position, film (if laced) is NOT tensioned. This position must be selected before lacing or unlacing film.

…with brakes ON. The spooling brakes are normally ON when tension is OFF to protect from film spillage if film is laced.

…with brakes OFF. If the brake pedal is pressed the brakes will be released. Although the backplates can now be rotated manually the spooling motors driving them each offer gentle resistance to lacing. This aids film loading as it not only reduces slack in the film when laced, but also deters the user from winding the end of the film onto the destination backplate in the wrong direction when lacing.
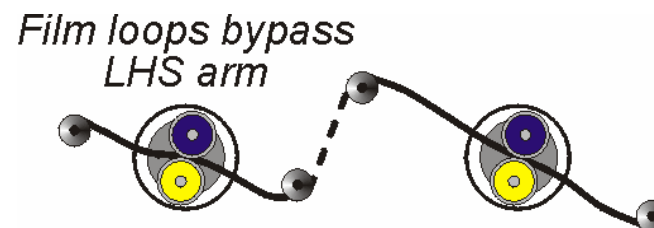

Figure 97 Compliance Arms – Lacing/Unlacing Position

Taking-up/Releasing Tension - tension is either being taken-up or released.

<u>Taking up tension.</u> The compliance arms rotate in a controlled manner into the film run position to apply film tension, the spooling brakes are released and power is applied to the spooling motors (spooling mode only). This takes a few seconds. Film tension can be adjusted from the *Transport Configuration Menu*.
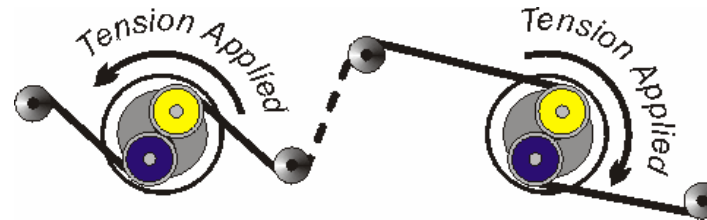

Figure 98 Compliance Arms – Film Run Position

Note: In the unlikely event that tension is unsuccessfully taken-up the servo system will return to the Tension OFF mode. To take-up tension again, first remove excess slack by releasing the brakes and rotating the backplates as necessary, then press the Film Tension Push-button again.
Note: The LHS compliance arm is NOT disabled when in loop mode and will rotate when taking-up film tension. This does NOT interfere with loop operation.

<u>Releasing tension.</u> The compliance arms rotate to release film tension, the spooling brakes are applied and power is removed from the spooling motors. This takes a few seconds.

Tension ON (Spooling Mode) - power remains applied to the spooling motors and the spooling brakes are OFF. The compliance arms remain in the film run position so tension is applied. The film transport system is ready to accept commands (if the door is closed). This position must be selected before running film from core to core.

Tension ON (Loop Mode) - the spooling brakes are OFF and the compliance arms remain in the film run position so tension is applied. The film transport system is ready to accept commands (if the door is closed). This position must be selected before running a film loop.
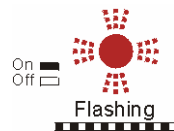
Fault Condition – Refer to Cintel Customer Support department.

Loop Guide Thumbscrew
The Loop Guide (shown in Figure 99) enables film loops (normally used for test purposes) to be fitted onto the machine. This is located in the centre of the deck plate between the two backplates, as shown in Figure 96.
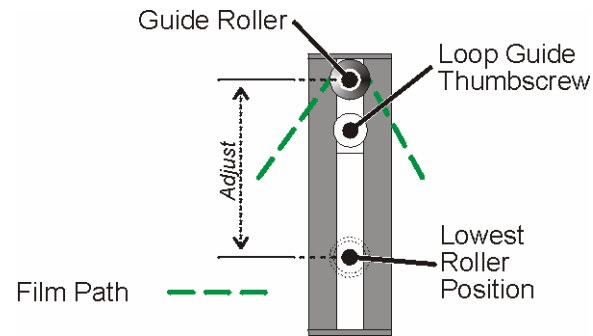
Figure 99 Loop Guide

Film loops are laced round the guide roller that is adjusted to remove excess slack[2] in the film. The guide roller is adjusted and locked in position by means of the loop guide thumbscrew.

Door Safety Interlock System
The Telecine has a safety interlock system fitted to the two front doors. If one of these doors is opened when the Telecine is transporting film the servo system will shut down and the film transport controls will be disabled. If the offending door is then closed the transport controls are re-enabled but the servo system will NOT resume its previous operating mode.

Gate
The Telecine can accommodate both 35/S35 and 16/S16 gates (shown in Figures 100 and 101 respectively). Provision is made to store one gate behind the Upper Control Panel.
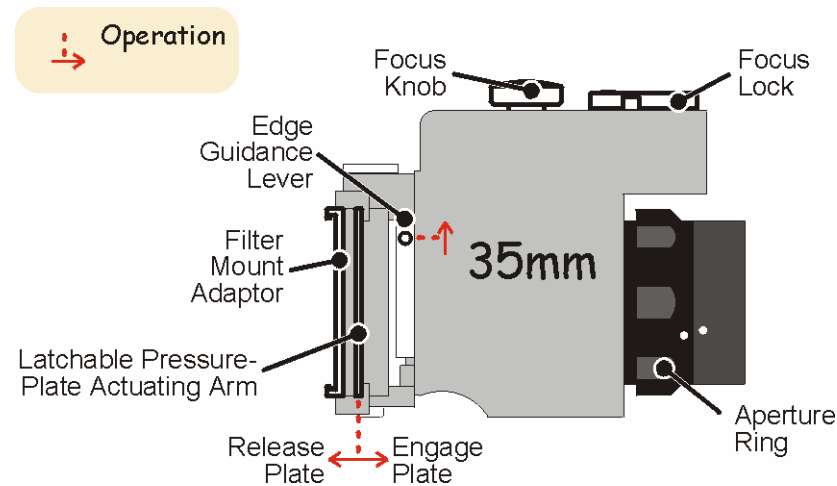

Figure 100 35mm/S35 Gate

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[2] A small amount of slack is required to allow the RHS compliance arm to operate effectively.
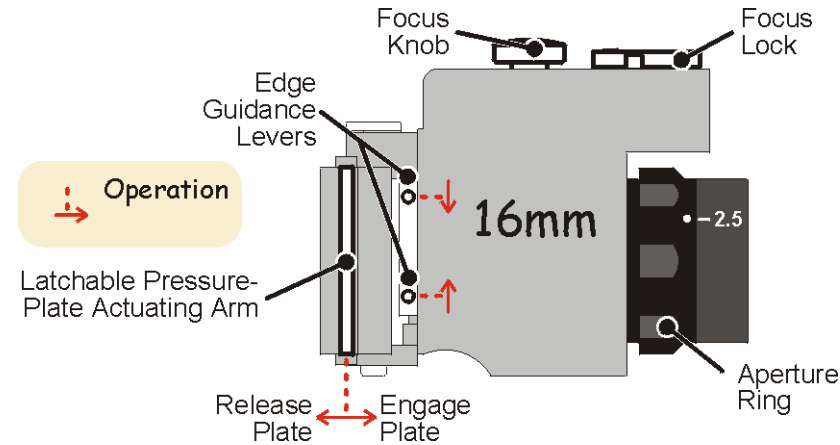
Figure 101 16mm/S16 Gate

Gate Features

Focus Knob and Lock
Both gates are fitted with a manual focus knob and focus lock. These are located on the top of the gate. Adjust the optical focus for optimum focusing as shown on a picture or waveform monitor. Lock the knob by rotating the lock towards the Stop.
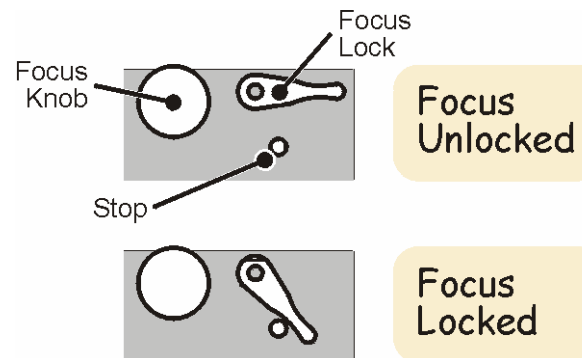

Figure 102 Gate Focus Knob and Lock

Aperture Ring
Both gates have variable aperture lens. Aperture ring position is detected by a sensor built into the deck plate and can be monitored at the remote control desk (refer to relevant manufacturer's documentation for further details).

- The aperture on the 35mm gate should usually be set fully open. To ensure that the gate aperture is set fully open, rotate the aperture ring to the end of its travel so that the dot on the ring is at its lowest point as shown in Figure 100.

- The lens on the 16mm gate should usually be set to 2.5. To ensure that the gate aperture is set to this position, rotate the aperture ring so that the dot on the ring is adjacent to -2.5 as shown in Figure 101.

Edge Guidance Lever/s
Gates are fitted with edge guidance lever/s, one lever on the 35/S35mm gate (see Figure 100) and two on the 16/S16mm gate (see Figure 101). These are operated after film is laced through the gate to ensure the film is correctly seated on the skid plate.

Latchable Pressure Plate Actuating Arm
A latchable plate is fitted to each gate that is used to apply a pre-determined down-force to the film as it passes over the skid plate. This is intended to be used as a focusing aid for bowed stock as it helps to flatten the film.. The plate is activated by the actuating arm shown in Figures 100 and 101.

Brake Pedal
The brake pedal is a foot-operated control used as an aid for film loading. If the pedal is pressed when film tension is OFF (the pedal is disabled when film is tensioned) the brakes will be released and the backplates will now be able to be rotated manually (albeit under the gentle resistance offered by the spooling motors – see *Film Tension Push-button*). Taking the foot off of the pedal re-applies the brakes. Note that the pedal must be released before applying film tension.

OPERATING PROCEDURES

This section guides the user step-by-step through the most common operations. To assist navigation through the menus shown on the upper control panel display, the following notation is added at the end of an instruction to identify the path to a particular menu function:

[TOP LEVEL MENU 🔘 > "NEXT MENU NAME" 🔘 > "NEXT MENU NAME" 🔘 >], etc, where

"🔘"   - represents a soft-button identity,

">"   - should be read as "calls up menu",

"NEXT MENU NAME"   - represents a menu identity.

Options and settings NOT covered by these procedures are explained in the *Control Reference* section of this chapter.

1.   Powering-Up

⚠ **Warning**

The power ON/OFF switch on the Telecine does NOT switch power ON/OFF to the remote control desk. Refer to relevant manufacturer's documentation for details.

1.1.   Switch on Power - move the power switch up into the ❙ position to switch power ON. The switch is located at the front of the machine on the lower left-hand side. The Telecine should NOT have film laced. The Telecine can be switched on either before or after the remote control desk. If the machine has not been shut down correctly a delay will be incurred, as data on the hard drive needs to be checked for possible corruption.

1.2.   Wait for Initialisation – Wait for approximately four minutes. During this period software will be downloaded from CD-ROM and Floppy Disk, C-REALITY will initialise and the display on the local control panel will show the *Debug Menu* (the Debug Menu is beyond the scope of this documentation and is NOT described in this handbook). **Do NOT attempt to perform any operations during initialisation**.

1.3.   When this process is complete the display will show the *Top Level Menu*. The following defaults apply:

CRT heaters OFF, CRT available.
EHT is OFF.
Local control is selected; *LOCAL* LED adjacent is illuminated.
Display shows *Top Level Menu*.
PEC and shading boards are NOT aligned.
Film tension is OFF.
Mechanism is in Stop condition.
Film standard is determined by vision gate selection.
Film format always defaults to Negative.
Aperture correction is turned OFF.
Audio output is OFF (if option is fitted).
Functions available via local display menu system adopt default settings.

1.4. <u>Switch ON CRT Heater</u> - Press *CRT ON* to switch on the CRT heater, the display will show `EHT WAIT`. When completed the display will show `EHT READY`, this takes approximately 30 seconds and indicates that EHT is now available. The CRT heater is subjected to a timeout and will switch off automatically if the EHT is off for more than 30 minutes

⚠️**Caution**

Do not leave Telecine in this mode (CRT heater switched ON, EHT switched OFF) as it could shorten CRT life. Either switch the EHT ON or the CRT heater OFF.
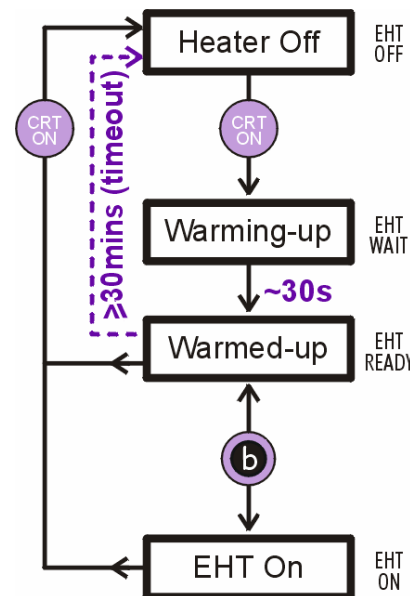
The warm-up sequence is illustrated below:

Fig 103

1.5. <u>Switch on EHT</u> - Press 🅑 (Top Level Menu) to switch on the EHT supply. EHT will be switched on after a short delay of a few seconds; the display will show `EHT ON`. [**TOP LEVEL MENU** 🅑]. EHT can be switched on from menus other than the *Top Level Menu* (see *Upper Control Panel/Menu Navigation and Functionality*).

2. **Daily Cleaning and Telecine Warm-Up**

The Telecine should be cleaned daily before operating.

2.1. <u>Open Doors</u> – Open the film transport door. The lower door will open automatically.

⚠️**Caution**

**Take care not to scratch the surfaces identified in Para. 2.2.**

2.2. <u>Clean and Dust</u> - During warm-up clean the capstan, rollers, spooling hub rubber pads and 16mm spacers with a lint-free cloth moistened with a mild detergent solution. Dust the CRT and the external optical surfaces of the vision gate with a camel-hair or similar brush.

2.3. <u>Allow Telecine to Finish Warm-Up</u> - If possible allow a total warm-up period of at least 30 minutes.

**3. Selecting and Fitting a Vision Gate**

Note: If The Oliver Option is fitted refer to the Oliver supplement as some of the fitting instructions differ from those below

The Telecine can accommodate both 35/S35 and 16/S16 gates. If the vision gate to be used has NOT been used before with this Telecine it is first necessary to align the CRT for use with the gate. Details for performing scan (CRT) alignment are available from Cintel service department and must only be carried out by qualified personnel. Provision is made to store one gate behind the Upper Control Panel.

   3.1.   Rotate the light flap away from the gate condenser lens area –to give access to the gate position.

   3.2.   Select and Fit Gate - Fit selected gate onto telecine as follows:
         (a) Pick-up gate using the handle provided ensuring that the focus knob is uppermost. The gate can be steadied with the other hand if desired.

   3.3.   (b) Locate top of gate *A* onto supporting rod *B* as shown in diagrams **1** and **2**. The edge guides located either side of the rod determine an approximate left-right position.
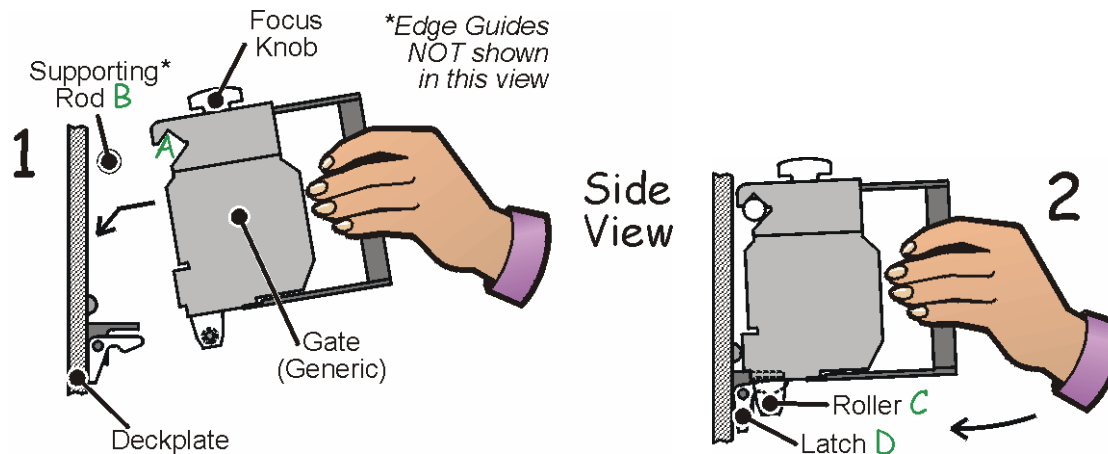

(c) Engage roller *C* under top of latch *D*. The bottom of the gate should locate firmly.

(d) Lock gate in position by rotating the handle to the right. See Figure **3**. The rear of the handle will now prevent the latch from moving.
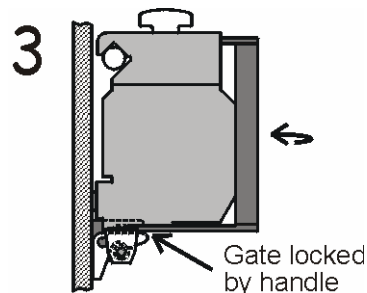
A barcode on the rear of the gate identifies the gate type to the machine by means of a *gate code*. The current gate code is displayed on the *Video Standard Menu*.

3.4. Check Gate Aperture – Ensure that the gate aperture is set correctly. The lens on the 35mm gate should usually be set fully open; the lens on the 16mm gate should usually be set to 2.5. To ensure that the gate is set correctly rotate the aperture ring to the relevant position as shown opposite. Ring position is detected by a sensor built into the deck plate and can be monitored at the remote control desk. Refer to relevant manufacturer's documentation for details.
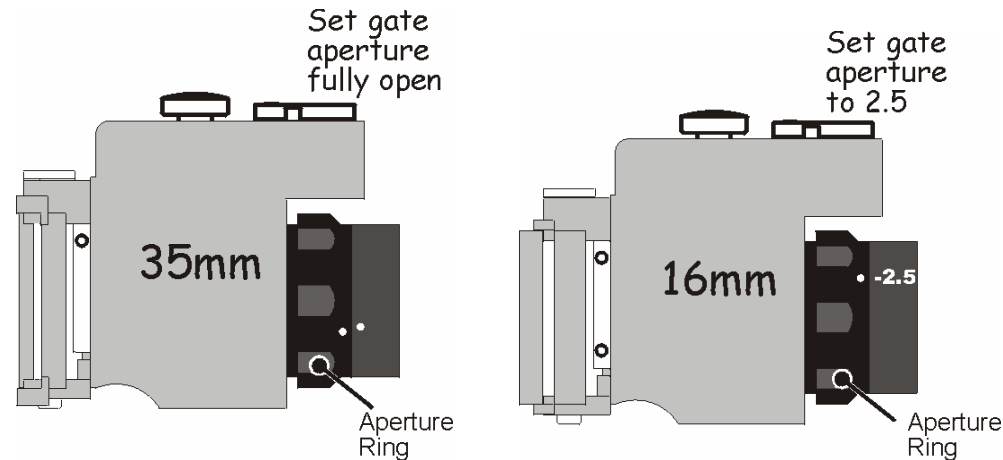

3.5. Rotate the light flap to sit between the gate and the cell box

3.6. Cancel Scan Effects and Offsets - Cancel (reset) any scan effects or offsets (if active). This can be done locally or at the remote control desk. Refer to relevant manufacturer's documentation for details.

4   Lacing Film Rolls

Warning
Ensure that film tension is switched OFF (film tension push-button extinguished) BEFORE touching any part of the film transport mechanism.

4.1 Check Film Drive is OFF - Ensure that film tension is switched OFF (film tension push-button extinguished). With tension OFF the compliance arms are in the film lacing/unlacing position and the spooling brakes are normally ON (unless released by the action of the brake) to protect from film spillage if film is laced.

4.2 Set Film Type - Press (Top Level Menu) to cycle through the options available on the display, NEG (Negative), POS (Positive) and IP (Inter-Positive). [TOP LEVEL MENU].

4.3 Remove Feed Core Holder - Remove the feed core holder from the spindle by pressing and holding the release lever and then pulling the holder off.
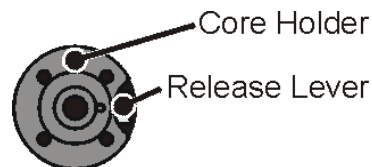
4.4   Check Backplate Rubber Spacer – For 16mm and S16mm only, ensure that the extra rubber spacer behind the backplate IS fitted; this is NOT required for 35mm or S35mm rolls.
(a) To remove the spacer, remove the backplate from the spindle by pulling the backplate forwards, remove the spacer from the spindle and then re-fit the backplate.
(b) To fit the spacer, remove the backplate from the spindle by pulling the backplate forwards, fit the spacer ensuring that the side with the written caution faces towards the deckplate and then re-fit the backplate. See figure.

4.5   Fit Feed Roll - Fit the feed roll onto the backplate spindle. The table below shows the recommended emulsion and soundtrack orientations for each film type.

Material	Emulsion	Sound Track
35 Neg/IP	Towards gate	Towards deck plate
35 Pos	Away from gate	Towards deck plate
16 Neg/IP	Towards gate	Away from deck plate
16 Pos	Away from gate	Away from deck plate

4.6   Ensure the core locates fully onto the backplate drive key.

4.7   Fit Core Holder – Fit the core holder onto the spindle so that for 35mm and S35mm the SMALL boss faces towards the backplate, and for 16mm and S16mm rolls the LARGE boss faces towards the backplate. Ensure the core holder and release lever are both correctly located after fitting.
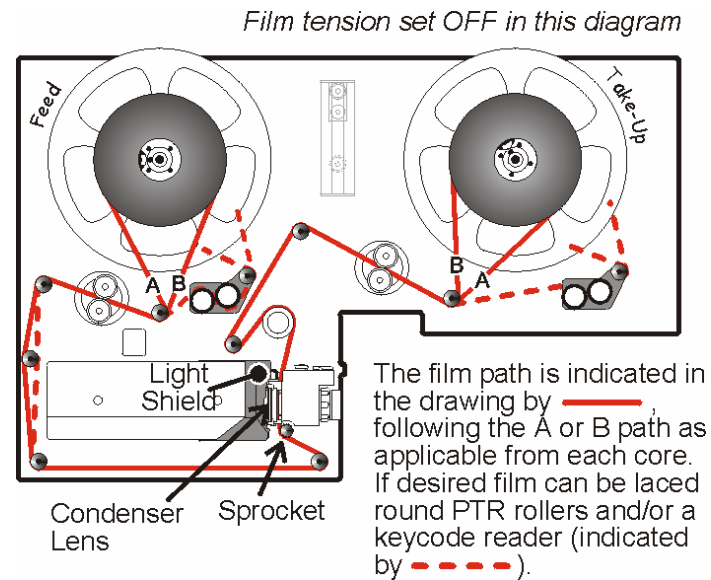
4.8
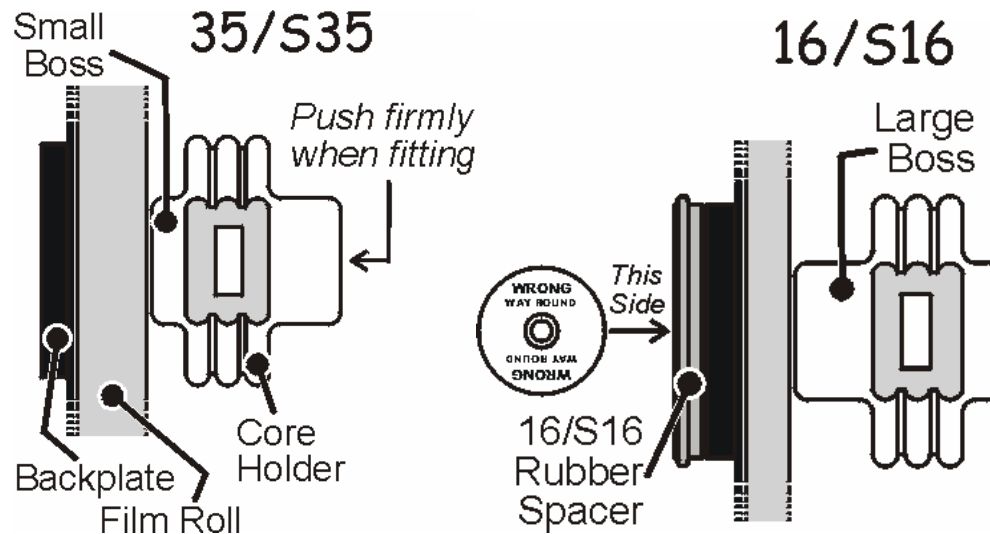
⚠️**Caution**

Always lace film leader where possible as exposed film can be scratched by handling.

4.9 <u>Release Spooling Brakes</u> - Press and hold down the brake foot-pedal to release the spooling brakes. Although the backplates can now be rotated manually the spooling motors driving them each offer gentle resistance

4.10 <u>Lace Film</u> - Taking hold of the end of the roll, lace the film according to the markings on the deck plate and attach to the take-up core. To lace through the gate first hinge back the light trap from the condenser lens area and then release the gate pressure plate to give access to the skid plate. Engage the pressure plate and replace the light trap when laced. If desired film can be laced round the PTR rollers.


Film tension set OFF in this diagram

The film path is indicated in the drawing by ——— , following the A or B path as applicable from each core. If desired film can be laced round PTR rollers and/or a keycode reader (indicated by – – – –).

4.11 <u>Check Lacing</u> - Ensure that the film is correctly located on the sprocket and the rollers, and that there is no slack in the film path, as shown opposite.

4.12 <u>Re-apply Brakes</u> - Release the brake foot-pedal to re-apply the brakes.

4.13 <u>Set Film Transport Mode</u> – Ensure that Loop Mode is set to OFF. Press (Engineering Menu #1) to toggle between ON and OFF. [TOP LEVEL MENU > ENGINEERING MENU #1].

⚠️**Caution**

**Ensure that the film is correctly located on the sprocket before applying film tension.**

4.14 <u>Restore Film Drive and Check Lacing</u> – Press (*Film Tension Push-button*) to apply power to the motors and release the spooling brakes. The backplates move into position and the compliance arms rotate in a controlled manner into the film run position to apply film tension. This takes a few seconds. When complete the push-button will be illuminated. (If the film's A or B wind has changed since the previous lacing, the transport will make two attempts to tension. This is normal and part of the Auto A/B wind system)
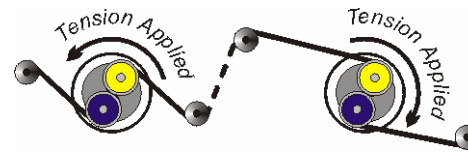
4.15 Note: In the unlikely event that tension is unsuccessfully taken-up the servo system will return to the Tension OFF mode. To re-take-up tension, first remove excess slack by releasing the brakes and rotating the backplates as necessary, then press (*Film Tension Push-button*) again.
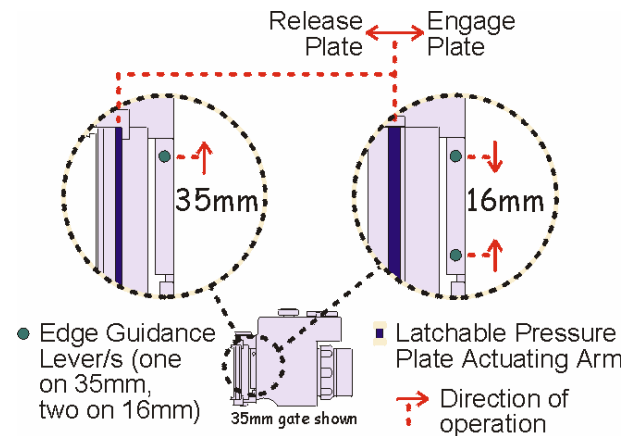
4.16 Ensure Film is Correctly Seated on Skid Plate – Operate edge guidance lever/s as shown opposite.

4.17 Engage Pressure Plate (as required) – Latch plate in position. The plate applies a pre-determined down-force to the film as it passes over the skid plate. This is intended to be used as a focusing aid for bowed stock as it helps to flatten the film.

4.18 Check Film Transport – Close the film transport door and press *DOOR* to close the lower door. Press *RUN/SHUTTLE FORWARD* once and allow the film to run for several seconds, then press *STOP* and open the doors. Check that the film lies correctly on all rollers, both compliance arms and the sprocket below the vision gate. Note: Your Telecine can be configured so that the lower door will close if the film transport door is closed. Refer to Cintel Customer Support department for details.

4.19 Re-check Film Seating – Operate the edge guidance lever/s and then close the doors again.

4.20 Adjust Gate Focus - Adjust the optical focus on the gate for optimum focusing as shown on a picture or waveform monitor. Rotate the focus lock lever to lock the focus.
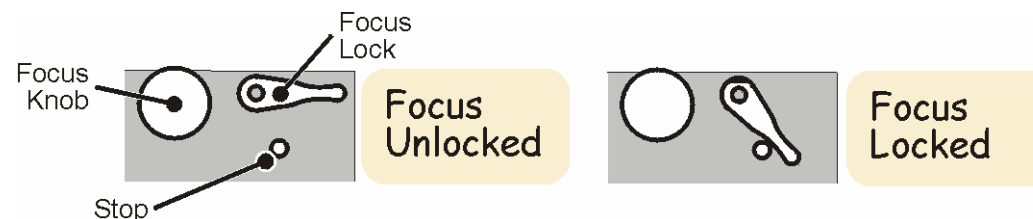
5   Lacing Film Loops

⚠️**Warning**

Ensure that film tension is switched OFF (film tension push-button extinguished) BEFORE touching any part of the film transport mechanism.

5.1   Check Film Drive is OFF - Ensure that film tension is switched OFF (film tension push-button extinguished). With tension OFF the compliance arms are in the film lacing/unlacing position and the spooling brakes are normally ON (unless released by the action of the brake) to protect from film spillage if film is laced.

5.2   Set Film Type - Press 🄴 (Top Level Menu) to cycle through the options available on the display, NEG (Negative), POS (Positive) and IP (Inter-Positive). [TOP LEVEL MENU 🄴].

5.3   Lace Film Loop - Lace the film loop according to the markings on the deck plate lacing round the roller on the loop guide. The table opposite shows the recommended emulsion and soundtrack orientations for each film type.

Material	Emulsion	Sound Track
35 Neg/IP	Towards gate	Towards deck plate
35 Pos	Away from gate	Towards deck plate
16 Neg/IP	Towards gate	Away from deck plate
16 Pos	Away from gate	Away from deck plate

5.4   Using the thumbscrew secure the plate that supports the roller in a position that removes excess film slack but leaves a small amount for compliance arm operation. To lace through the gate first hinge back the light trap between the condenser lens and the rear of the gate, then slide the film between the skid plate and pressure plate. Replace the light trap once laced. Note that the left-hand side compliance arm is not used in this mode.
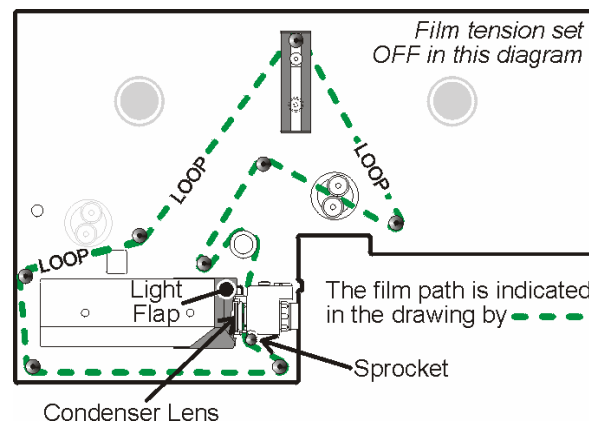
5.5   Check Lacing - Ensure that the film is correctly located on the sprocket and the rollers, and that there is no slack in the film path, as shown in the figure.

5.6   Set Film Transport Mode – Ensure that Loop Mode is set to ON. Press 🔴d (Engineering Menu #1) to toggle between ON and OFF. [TOP LEVEL MENU 🔵f > ENGINEERING MENU #1🔴d].

⚠️**Caution**

Ensure that the film is correctly located on the sprocket before applying film tension.

5.7   Restore Film Drive and Check Lacing – Press (*Film Tension Push-button*) to apply power to the compliance arm motors. The compliance arms rotate in a controlled manner into the film run position to apply film tension. This takes a few seconds. When complete the push-button will flash.
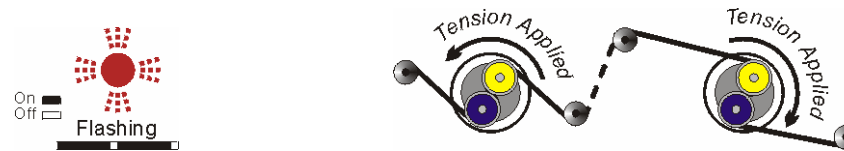
Note: In the unlikely event that tension is unsuccessfully taken-up (because of excess film slack) the servo system will return to the Tension OFF mode. To re-take-up tension, first remove excess slack and then press (*Film Tension Push-button*) again.
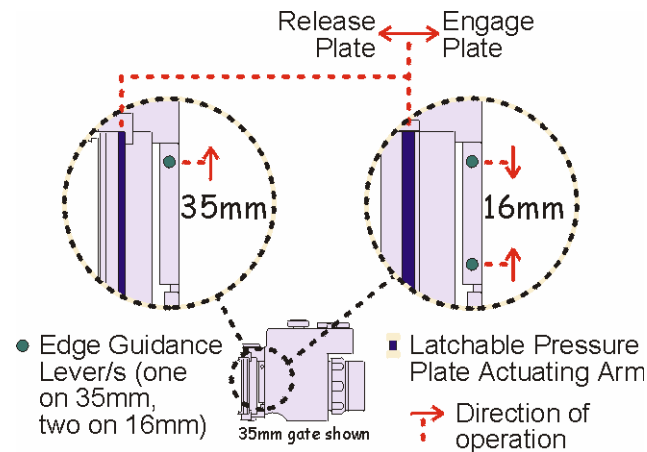
5.8   Ensure Film is Correctly Seated on Skid Plate – Operate edge guidance lever/s as shown opposite.

5.9   Engage Pressure Plate (as required) – Latch Pressure plate in position. The plate applies a pre-determined down-force to the film as it passes over the skid plate. This is intended to be used as a focusing aid for bowed stock as it helps to flatten the film.

5.10   Check Film Transport – Close the film transport door and press *DOOR* to close the lower door. Press *RUN/SHUTTLE FORWARD* once and allow the film to run for several seconds, then press *STOP* and open the doors. Check that the film lies correctly on all rollers, the compliance arm and the vision gate sprocket. Note: Your Telecine can be configured so that the lower door will close if the film transport door is closed. Refer to Cintel Customer Support department for details.

5.11   Re-check Film Seating – Operate the edge guidance lever/s and then close the doors again.

5.12   Adjust Gate Focus - Adjust the optical focus on the gate for optimum focusing as shown on a picture or waveform monitor. Rotate the focus lock lever to lock the focus.
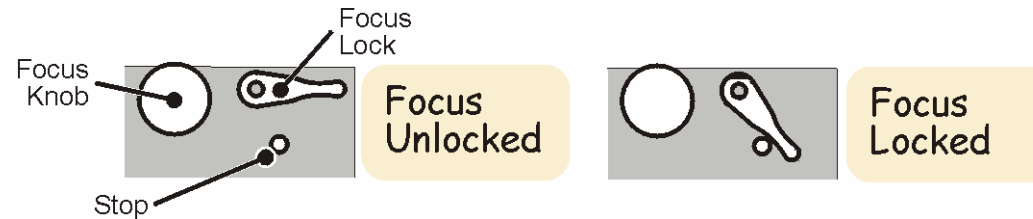
6   Automatic Alignment and Detector Calibration
During the alignment process the output of the video channel is frozen. Consequently the pictures observed on the picture monitor and any other external monitor are also frozen. Automatic alignment aligns the PEC and shading boards.

⚠️**Warning**
Ensure that film tension is switched OFF (film tension push-button extinguished) BEFORE touching any part of the film transport mechanism.

⚠️**Warning**
Avoidance of external illumination
The option Oliver is very sensitive to stray light and it is essential to avoid any external illumination, (daylight, artificial or from monitoring equipment) from falling on the film path when C-REALITY is in use or during detector calibration and auto align. It is generally sufficient to ensure the Oliver light shield is fitted and the lower deckplate door is closed.

6.1   Detector Calibration
      Notes :   **When using a new gate for the first time and at other times when the local displays prompts, Detector Calibration will be required**.
                   A detector calibration automatically includes an Auto Align, it is therefore not necessary to perform an Auto Align after a detector calibration

6.2   Check Gate Focus - Ensure the gate is correctly focused.

6.3   Inhibit Film Drive - Ensure *(Film Tension Push-button)* is extinguished. The compliance arms are in the film lacing/unlacing position, film is NOT tensioned.

6.4   Remove Film from Vision Gate.

6.5   Invoke Detector Calibration.) Press 🅮 (Auto Alignment Menu). This takes a few minutes; progress is shown on the display. With the Oliver option it is important to note one special procedure during the calibration. At about the 50% point in the detector calibration the local panel display will prompt "Please insert calibration card". A white card with high reflectance should be placed between the Relay Lens and the Oliver main block, with the highly reflective surface facing towards the film gate, as shown at * in Figure 105. Ensure the card covers the entire Oliver block aperture. Detector calibration should then be continued. The card should be left in place until the local panel display prompts for its removal "Please remove calibration card". This situation will NOT occur if Oliver is not fitted. Detector calibration should then be completed

6.6 Automatic Alignment

6.7 Check Gate Focus - Ensure the gate is correctly focused.

6.8 Inhibit Film Drive - Ensure *(Film Tension Push-button)* is extinguished. The compliance arms are in the film lacing/unlacing position, film is NOT tensioned.

6.9 Remove Film from Vision Gate.

6.10 Automatic Alignment – Press **(f)** (Auto Alignment Menu) to invoke automatic alignment.. Alignment takes approximately 1.5 minutes; progress is shown on the display.

6.11 Recommended Alignment Beam Currents
As a general guide use an alignment beam current of 300μA with all film types..

6.12 Further guidance on Beam Current settings

A beam current of 300uA should be used for all film materials. A beam current of 150uA, used to potentially extend the CRT life, will reduce the performance of the scanner.

Alignment Failure
Alignment failure may result from incorrect PEC trip levels. To calibrate the PECs (detectors) see section 6.1 to 6.5, Detector Calibration

7   Running Film

7.1 Lace Film and Focus Gate - See Procedure 4 or 5 if necessary.

7.2 Select Operating Beam Current - Press **(c)** (Top Level Menu) to toggle between 150uA and 300uA as the operating beam current **[TOP LEVEL MENU (c)]**.

7.3 Select Audio Source[3] - Press **(j)** (Top Level Menu) to call-up the Audio Menu. **[TOP LEVEL MENU (j)]**. Select the required options from this menu.

7.4 Check Output - Run the film, check framing, audio and video levels and adjust as necessary.

7.5 Cue Telecine - Reverse run the film to the required starting point.

7.6 Reset Counter - Press **(i)** (Top Level Menu) to reset the counter. **[TOP LEVEL MENU (i)]**.

7.7 Run Film.

8   Powering-Down

⚠️**Warning**

Ensure that film tension is switched OFF (film tension push-button extinguished) BEFORE touching any part of the film transport mechanism.

8.1 Rewind Film - Run film back onto the feed core. If auto stop is ON (*Transport Configuration Menu*) the film transport system will automatically shut down when the end of the reel is neared. To run film off select shuttle again.

8.2 Check Film Transport - Ensure film transport system has stopped.

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[3] If audio option fitted

8.3   Open Film Transport Door.

8.4   Inhibit Film Drive - Ensure that film tension is switched OFF (film tension push-button extinguished).

⚠️**Caution**

Film should NOT be left laced and hence tensioned while the Telecine is out of operation.

8.5   Remove Film Core.

8.6   Close Film Transport Door.

8.7   Switch Off EHT and CRT Heater - Press *CRT ON*. This turns OFF both the EHT and the CRT heater.

⚠️**Caution**

The Telecine must be shut down as described below BEFORE the power is switched off. Failure to observe this procedure may corrupt the internal hard drive and delay the next switch on sequence.
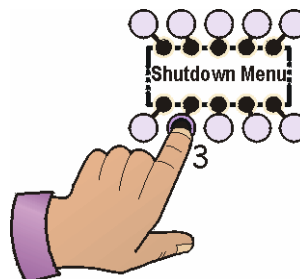
8.8   Shutdown Telecine – Press and hold **a** (Top Level Menu) to display the Status Page (**Action 1**).
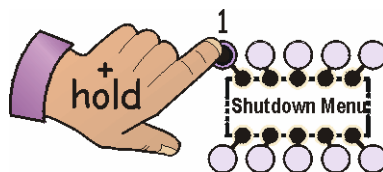
With **a** still held press and hold **e**, **f** and **j** simultaneously (marked **SHUTDOWN**) to display the Shutdown Page (**Action 2**).
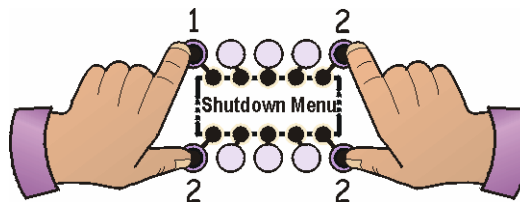
Press **g** (Shutdown Page) to confirm shutdown (**Action 3**).

When complete the display indicates that the machine can now be switched off. Failure to correctly shut down the machine will incur a delay on next switch-on, as data on the hard drive needs to be checked for possible corruption.

8.9   Switch Off Power - Move power switch down into the **O** position to switch power OFF.

9   Invoking a Test Pattern
C-REALITY provides a selection of test patterns. These are available on the *Test Pattern Menu* that is shown in Figures 39-42.

9.1   Select the Test Pattern Menu - Press 🅳 (Engineering Menu #2) **[TOP LEVEL MENU 🅵 > ENGINEERING MENU #1 🅵 > ENGINEERING MENU #2 🅳 > TEST PATTERN MENU]**.

9.2   Select Test Pattern – Press 🅵 to 🅹 as required. 🅲 can be used to alter the orientation of the pattern.

10   Installing System Software (for the first time)

10.1   Switch Power ON - Switch on the mains supply to the Telecine and then move the power switch up into the **|** position to switch power ON. The switch is located at the front of the machine on the lower left-hand side. The power must be on for the CD drive tray to operate.

10.2   Insert CDROM Disc - Open the Local Control Panel and insert the CDROM disc (System Software) into the LOWER drive. Ensure that the supplied floppy disk is always in the UPPER drive as this disk includes the Telecine configuration files. The floppy drive allows the firmware and machine configuration to be updated. Please refer to Cintel service department for further details.

10.3   Auto-Boot Telecine – Switch power off and then on again to auto-boot the Telecine. Auto-booting takes approximately four minutes. **During this period do NOT perform any operations.** Refer to *Procedure 1* for further details.

11 **Setting the Best Primary Colour Correction at the Local Control Panel**

11.1 Set Colour Defaults – Press **c** (Engineering Menu #1) to set all colour controls to their default settings. It may be beneficial to save this as a base memory or note on the remote control desk for each film type. **[TOP LEVEL MENU f > ENGINEERING MENU #1 c].**

11.2 Set APD Levels – Setting the APD levels maximise signal-to-noise ratio and dynamic performance. These adjustments should be made from the local control panel to ensure that the Telecine's pre-set optimum APD levels are selected as a starting position for further adjustment and NOT any setting that may be pre-programmed in the control desk. **These adjustments are essential in order to achieve the best performance from your Telecine**.

(i) *Initial Adjustment* - Press **e** (Top Level Menu) to cycle through the options available on the display, NEG (Negative), POS (Positive) and IP (Inter-Positive). Selecting the film type automatically sets optimum APD levels for Kodak TAF: Positive, Inter-Positive or Negative Vision. **[TOP LEVEL MENU e].**

(ii) *Fine Adjustment* – Ensure that representative film* is in the gate. Press **PEC** on the local control panel to select the PEC Control Menu. The following adjustments are made while viewing a waveform monitor

(a) For Positive and Inter-Positive film adjust **3** (PEC BLUE) to achieve the maximum level without clipping and then adjust **2** (PEC GREEN) and **1** (PEC RED) for balance.

(b) For Negative film, adjustments are made while **observing the black levels of the video signals.** Adjust **3** (PEC BLUE) to achieve the maximum level without clipping and then adjust **2** (PEC GREEN) and **1** (PEC RED) for balance. If desired increase pre-gamma lift **1** (Top Level Menu) and gain **3** to improve clip visibility. Reset these controls after APD adjustment is complete.

* The film density should include a minimum density likely to be encountered in real transfer situations.

11.3 Set Film Masking - Set the required masking either from the local control panel (on the Log Masking Menu) or the remote control desk. Masking can be selected independently of the film type to compensate for unwanted absorption and the inter-image effects of the dyes within the given film stock. The Log Masking Menu is selected on the local control panel by pressing **J** (Engineering Menu #2). **[TOP LEVEL MENU f > ENGINEERING MENU #1 f > ENGINEERING MENU #2 J > LOG MASKING MENU].**

11.4 Make Pre-Gamma Adjustments – Adjust pre-gamma lift and gain (**Pre-only Mode**) either from the local control panel or the remote control desk - minimal adjustments should be required to set and balance, black and white levels - very accurate colour balance is not a pre-requisite at this point. Due to the extended dynamic range of the APD's it is not necessary for blacks and whites to be adjusted near to clip. Allow approximately 15-20% headroom for black and white levels as shown in the figure below to allow room to stretch blacks and whites when making post-gamma adjustments (**Normal Mode**).
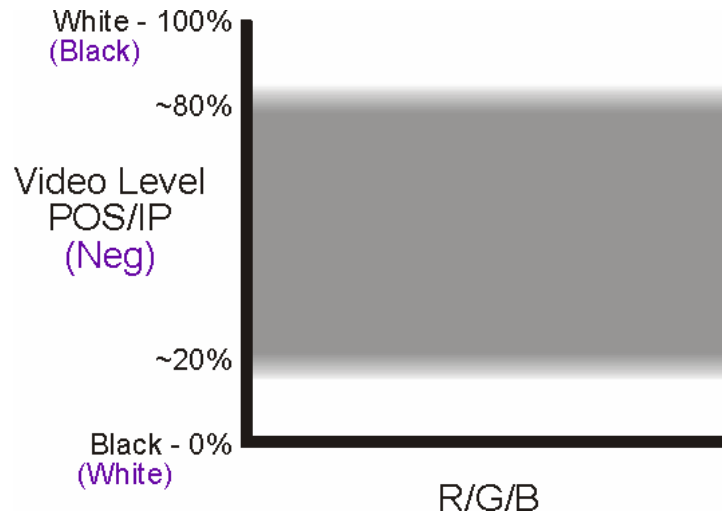
Master pre-gamma lift and gain adjustments can be made on the Top Level Menu on the local control panel: press 🅗 (Top Level Menu) if required to select pre-gamma and then adjust ❶ and ❸; differential adjustments can be made from the PCC Control Menu: press 🅘 (Engineering Menu #2) to select the PCC Control Menu. Refer to Figures 52-56 for further details. **[TOP LEVEL MENU 🅕 > ENGINEERING MENU #1 🅕 > ENGINEERING MENU #2 🅘 > PCC CONTROL MENU]**.

11.5   Make Post-Gamma Adjustments – Adjust post-gamma lift and gain (**Normal Mode**). These adjustments can also be performed on the local control panel. The headroom allowed when making the pre-gamma adjustments allows plenty of room to stretch blacks and whites without going into clip.

12   Setting Remote Controller Base memories and Defaults

This selection assumes some familiarity with Telecine controllers and terminology used for C-REALITY colour channel

Figures
Negative Setup

Figure 1a Da Vinci PCC level Display	Figure 1b Pandora PCC level Display	
Figure 2 a Da Vinci Gains & Lift for PEC setup	Figure 2b Pandora Gains & Lift for PEC setup	Figure 2c Typical waveform prior to PEC adjustment
Figure 3 PEC gain in Negative in clip		
Figure 4 PEC gain in Negative best setup		
Figure 5a Da Vinci typical PCC levels in NEG	Figure 5b Pandora typical PCC levels in NEG	Figure 5c Typical Negative balanced waveform

Positive Setup

Figure 6a Da Vinci PCC level Display	Figure 6b Pandora PCC level Display	
Figure 7 a Da Vinci Gains & Lift for PEC setup	Figure 7b Pandora Gains & Lift for PEC setup	Figure 7c Typical waveform prior to PEC adjustment
Figure 8 PEC gain in Positive in clip		
Figure 9 PEC gain in Positive best setup		
Figure 10a Da Vinci typical PCC levels in POS	Figure 10b Pandora typical PCC levels in POS	Figure 10c Typical Positive balanced waveform

Inter-Positive Setup

Figure 11a Da Vinci PCC level Display	Figure 11b Pandora PCC level Display	
Figure 12a Da Vinci Gains & Lift for PEC setup	Figure 12b Pandora Gains & Lift for PEC setup	Figure 12c Typical waveform prior to PEC adjustment
Figure 13 PEC gain in Inter-Positive in clip		
Figure 14 PEC gain in Inter-Positive best setup		
Figure 15a Da Vinci typical PCC levels in IP	Figure 15b Pandora typical PCC levels in IP	Figure 15c Typical Inter-Positive balanced waveform

12.1   C-REALITY utilises a unique approach to primary colour correction, enabling a large dynamic range of control and therefore the ability to deal with even the most demanding of film.

To achieve results that make use of the superior benefits of C-REALITY it is important to ensure that your controller, da Vinci, or Pogle is pre-set to optimised defaults. These can be stored in Base memories (da Vinci), or Notes (Pogle)

Initial optimal adjustments ensure that the very best pictures are maintained in all respects and especially in terms of signal to noise performance and dynamic range. The important settings here are the PEC/APD controls.

While Cintel ensure that the scanner is in a near optimised mode on power up and under local control, switching to remote control, by necessity, will overwrite any locally stored settings. It is therefore necessary to establish these default settings within the remote controller memory.

The following describes C-REALITY and assumes that there are no base memories or notes set within the external controllers and that an auto alignment has been carried out – for best results 300uA beam current should be used. The basic concept for driving the APD pick up devices remains similar to PMTs used in earlier generations of Telecine such as Ursa or even MK3's. However the following includes specific references to functions available on C-REALITY.

12.2   Stage 1. – NEGATIVE FILM TYPE

The controller should be set in PRE Gamma mode only, with 'Extended PEC range' selected if applicable.
The Da Vinci GUI will indicate PRE Only mode by the 'greying out' of the post controls and a Red bar over the PRE control graphics. Figure 1a
The Pogle GUI indicates which mode is selected within the 'C-REALITY' window, and the tracker-balls turn Red. Figure 1b
Select Negative (Vision) log Masking (if desired). Toggle film type to Negative mode with the scene to be transferred already in the film gate. (TAF in this example)

Fig. 1a – Da Vinci Colour Bar Display (PRE ONLY mode)   Fig. 1b – Pogle C-REALITY PCC window (PRE ONLY mode)
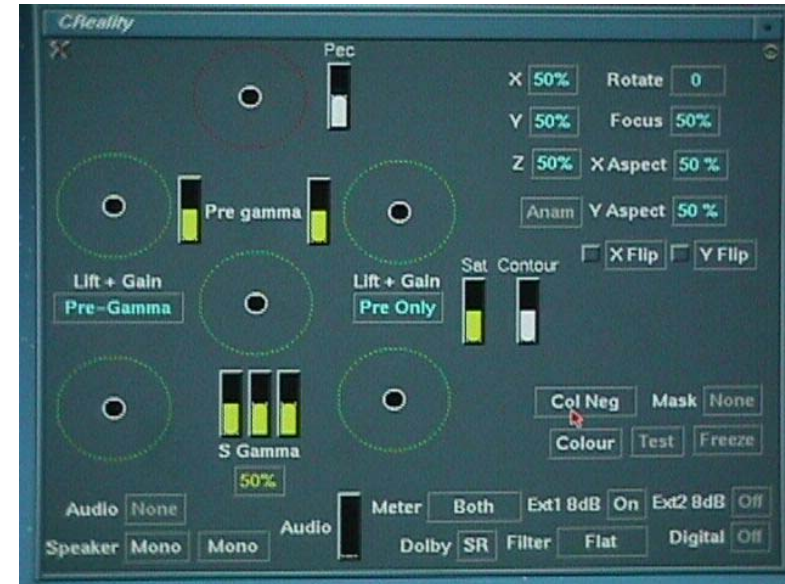
Turn the master PRE Gain control up significantly and alter the master PRE Lift control such that the black level and black clip point can be seen easily on a waveform monitor (At this point all signals will be severely white clipped!). N.B. In negative, you will initially probably only see a signal in the Red Channel.
See fig. 2a, 2b & 2c

Fig 2a – Typical 'expanded' control values (Da Vinci)
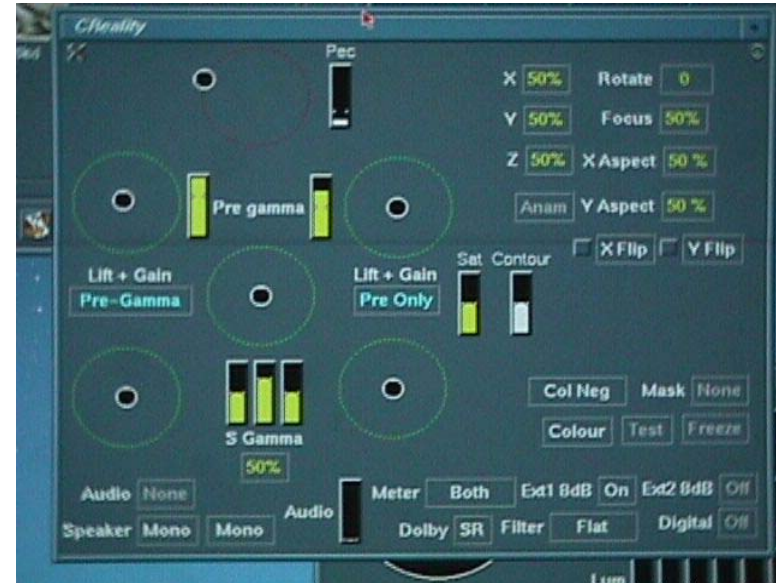
Fig. 2b – Typical 'expanded' control values (Pandora)
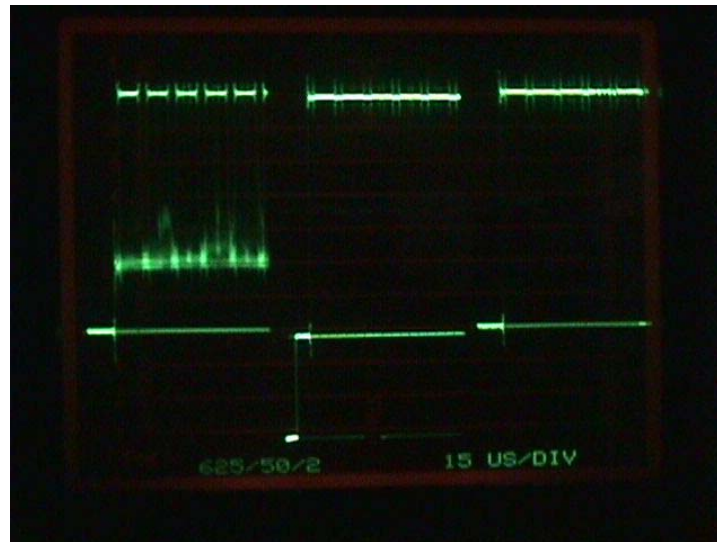
Fig. 2c – Only red visible, all signals severely white clipped!

12.3   Stage 2. – NEGATIVE FILM TYPE

Adjust all the PEC/APD controls such that the signals head towards video black i.e. you appear to be turning the signal levels <u>down</u>. Continue to turn the signals down until it is clear that the video is becoming black clipped. N.B. At this stage we are ONLY interested in the Blacks of the signals. See figure 3
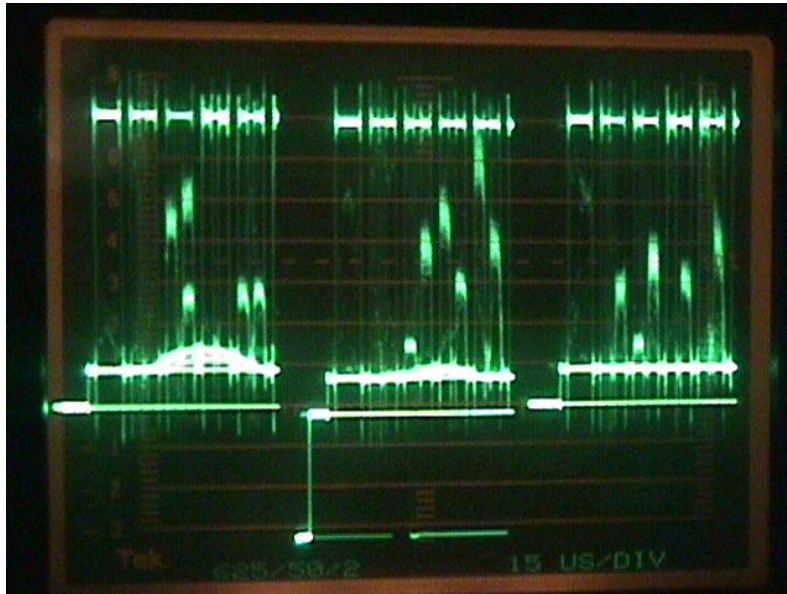
Fig. 3 – R, G & B black levels clearly in clip.   Fig. 4 – PEC levels set correctly with headroom
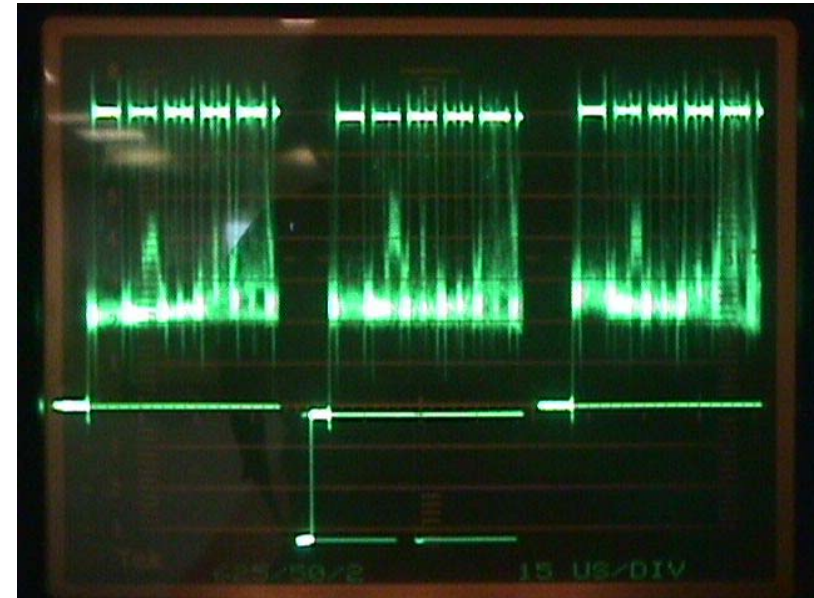
If you do not see something similar to that shown in figure 3 above it may be that you need to turn the PRE lift controls a little higher or stretch the signals further with gamma or gain (N.B. Gamma cannot be altered on Pogle whilst in Pre gamma mode).

12.4   Stage 3. – NEGATIVE FILM TYPE

Now you have established where the detector clip points lie. N.B. operating in this area will result in some loss of picture information, it is now necessary to turn the signals up until the clip point is cleared and some head room allowed for as seen in figure 4.

THIS IS <u>THE OPTIMUM </u>SETTING FOR YOUR PEC's, THEY SHOULD NOT BE RE-ADJUSTED for the rest of this procedure. Usually this setting will be sufficiently accurate to cater for the rest of a roll but if significant exposure or stock changes occur, it should be re-checked. See Figure 4.

12.5   Stage 4. – NEGATIVE FILM TYPE

The PRE Lift, Gain, and Gamma controls can now be returned to more usual levels such that the blacks and whites are unclipped and balanced.
See Fig. 5a, 5b & c.

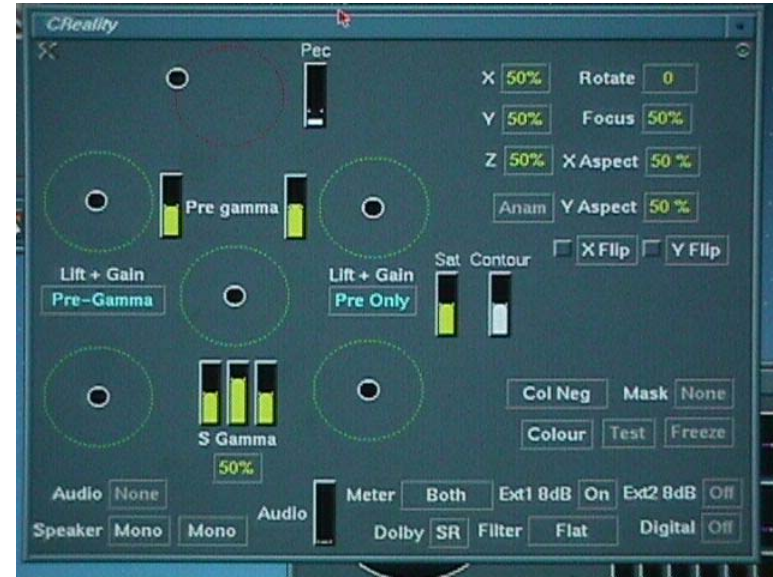Fig. 5a – Typical Da Vinci Settings for PRE Gammas

Fig. 5b – Typical Pogle settings for PRE Gammas

Fig. 5c – Balanced RGB – Vision TAF (no Mask)

The main purpose of the PRE Gamma correction is to present a balanced signal to the POST Gamma corrector, giving better luminance tracking of controls.
You can now switch into POST Gamma mode where creativity can take over from Technical set up.

Cintel recommend that a Base memory or Note is created using the method described above for the latest Kodak Telecine Analysis Film (TAF).

12.6   Stage 1. – POSITIVE FILM TYPE

The controller should be set in PRE Gamma mode only, with 'Extended PEC range' selected if applicable.
The Da Vinci GUI will indicate PRE Only mode by the 'greying out' of the post controls and a Red bar over the PRE control graphics. Figure 6a
The Pogle GUI indicates which mode is selected within the 'C-REALITY' window, and the tracker-balls turn Red. Figure 6b
Select Relevant log Masking (if desired). Toggle film type to Positive mode with the scene to be transferred already in the film gate.

Fig. 6a – Da Vinci Colour Bar Display (PRE ONLY mode)   Fig. 6b – Pogle C-REALITY PCC window (PRE ONLY mode)
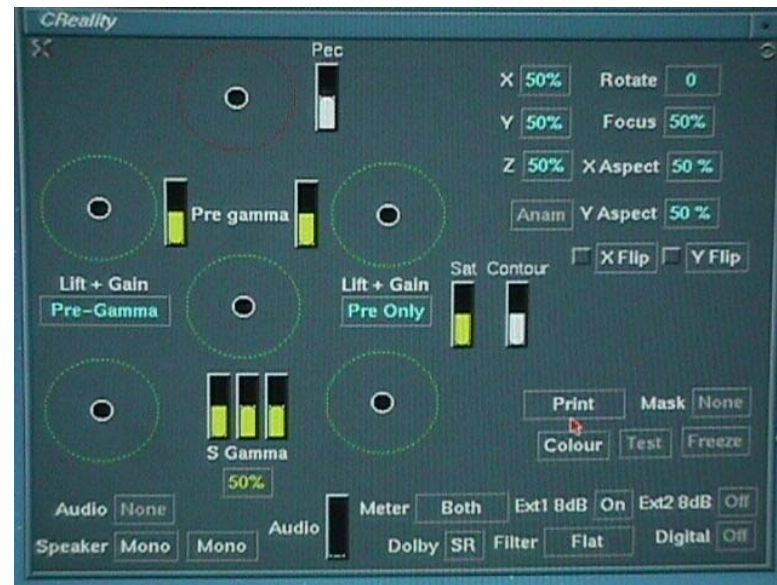
Turn the master PRE Gain control down significantly such that the white level can be seen easily on a waveform. See fig. 7

Fig. 7b – Typical Da Vinci Settings for PEC set

Fig. 7c – Typical Pogle settings for PEC set.
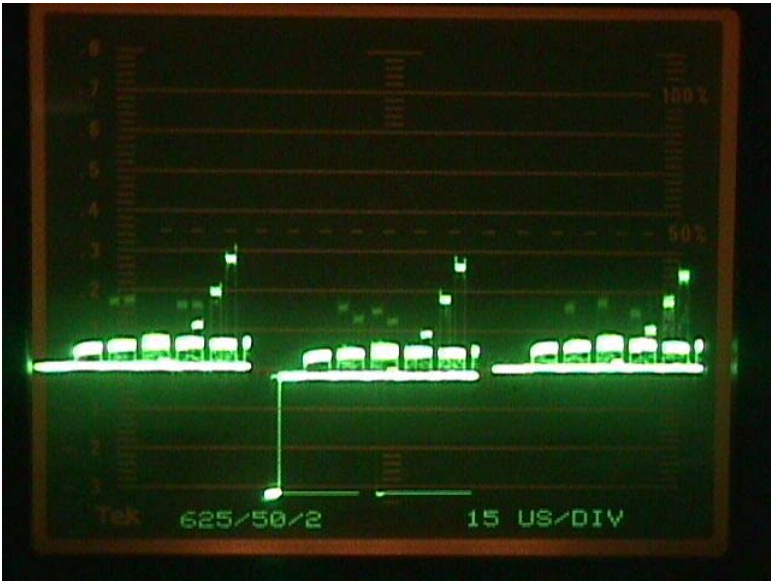
Fig. 7a – Typical view with PRE gain turned down

12.7   Stage 2. – POSITIVE FILM TYPE

Adjust the RG & B PEC/APD controls such that the signals head towards white i.e. you will appear to be turning the signal level <u>UP</u>. Continue to turn the signals UP until it is clear that the video is becoming white clipped. N.B. At this stage we are ONLY interested in the Whites of the signal. See figure 8
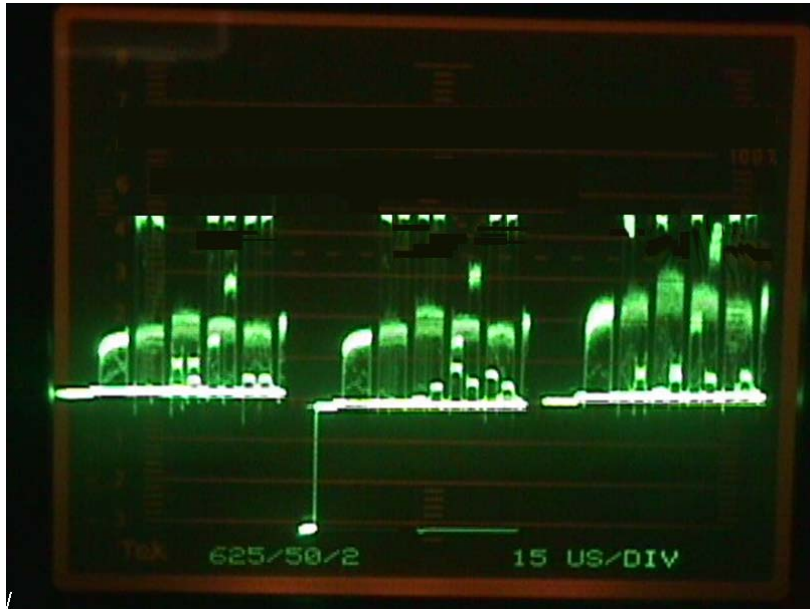
Fig. 8 – R, G & B white levels clearly in clip.   Fig. 9 – PEC levels set correctly with headroom
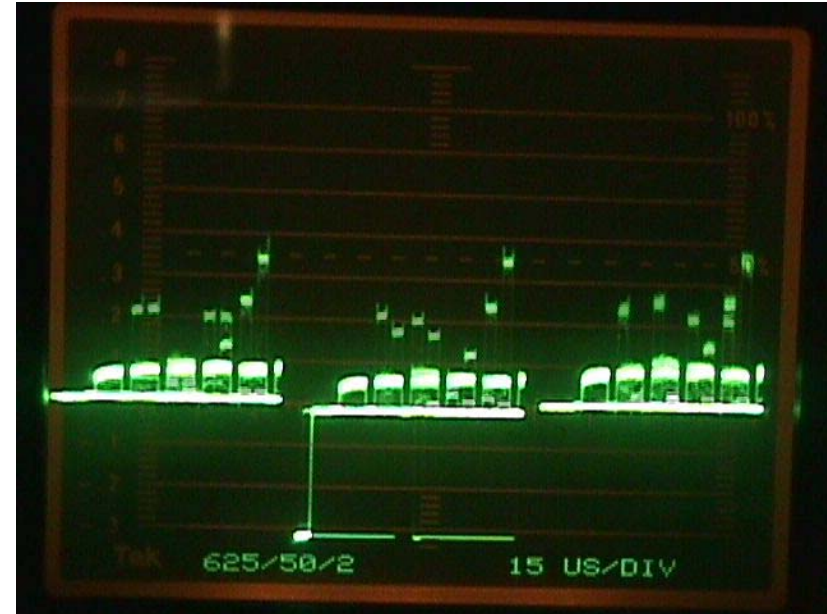
If you do not see something similar to that shown in figure 8 above it may be that you need to turn the PRE Gain controls further down and readjust your PEC controls.

12.8   Stage 3. – POSITIVE FILM TYPE

Now you have established where the detector clip point lies. N.B. operating in this area will result in some loss of picture information, it is now necessary to turn the signals down until the clip point is cleared and some head room allowed for as in figure 9.

THIS IS <u>THE OPTIMUM </u>SETTING FOR YOUR PEC's, THEY SHOULD NOT BE RE-ADJUSTED for the rest of this procedure. Usually this setting will be sufficiently accurate to cater for the rest of a roll but if significant exposure changes occur, it should be re-checked. See Figure 9.

12.9   Stage 4. – POSITIVE FILM TYPE

The PRE Lift, Gain, and Gamma controls can now be returned to more usual levels such that the blacks and whites are unclipped and balanced. See Fig. 10a, 10b & 10c

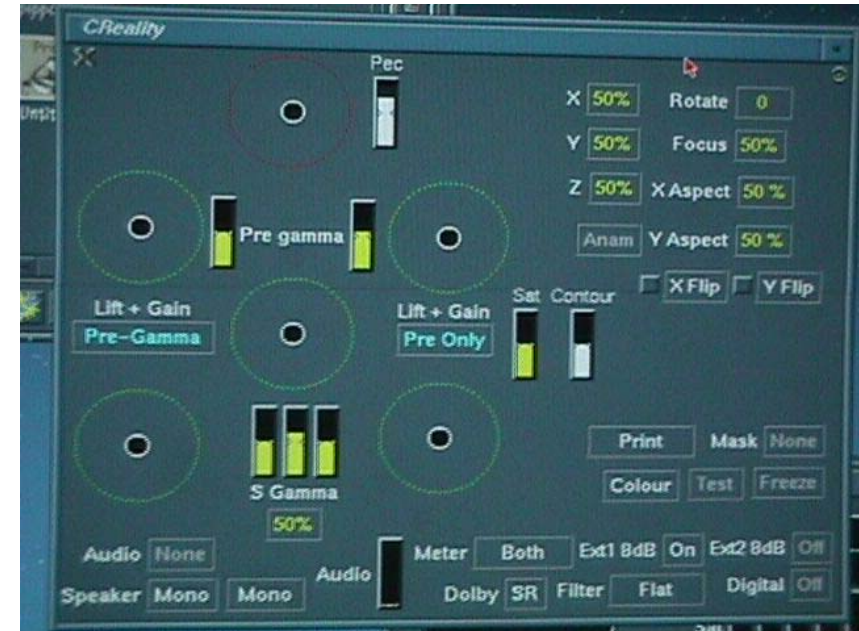Fig. 10a – Typical Da Vinci settings for PRE Gammas
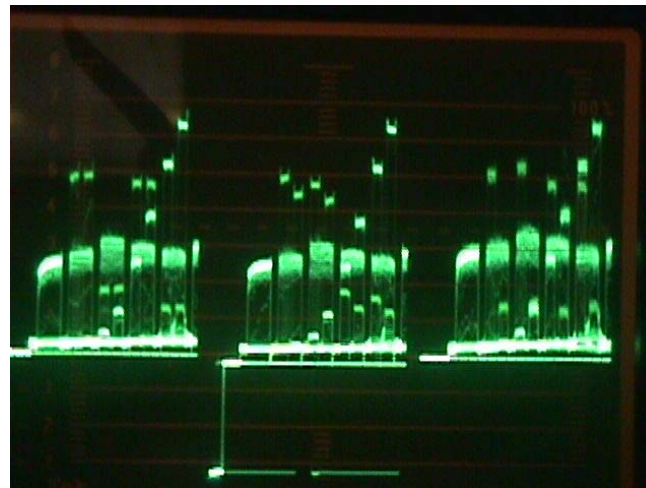

Fig. 10b Typical Pandora settings for PRE Gammas

Fig. 10c – Balanced RGB – Positive TAF (no Mask)

12.10   Stage 5. – POSITIVE FILM TYPE

The PRE Gain and Lift controls can now be re adjusted for a 'Flat' grade – i.e. Balanced, unclipped Blacks and Whites. You can now switch into POST Gamma mode where creativity can take over from Technical set up!

Cintel recommend that a Base memory is created using the method described above and the latest Kodak Telecine Analysis Film (TAF).

12.11   Stage 1. – INTER-POSITIVE FILM TYPE

The controller should be set in PRE Gamma mode only, with 'Extended PEC range' selected if applicable.
The Da Vinci GUI will indicate PRE Only mode by the 'greying out' of the post controls and a Red bar over the PRE control graphics. Figure 6a
The Pogle GUI indicates which mode is selected within the 'C-REALITY' window, and the tracker-balls turn Red. Figure 6b
 Select Relevant log Masking (if desired). Toggle film type to Positive mode with the scene to be transferred already in the film gate.

Fig. 11a – Da Vinci Colour Bar Display (PRE ONLY mode)   Fig. 11b – Pogle C-REALITY PCC window (PRE ONLY mode)
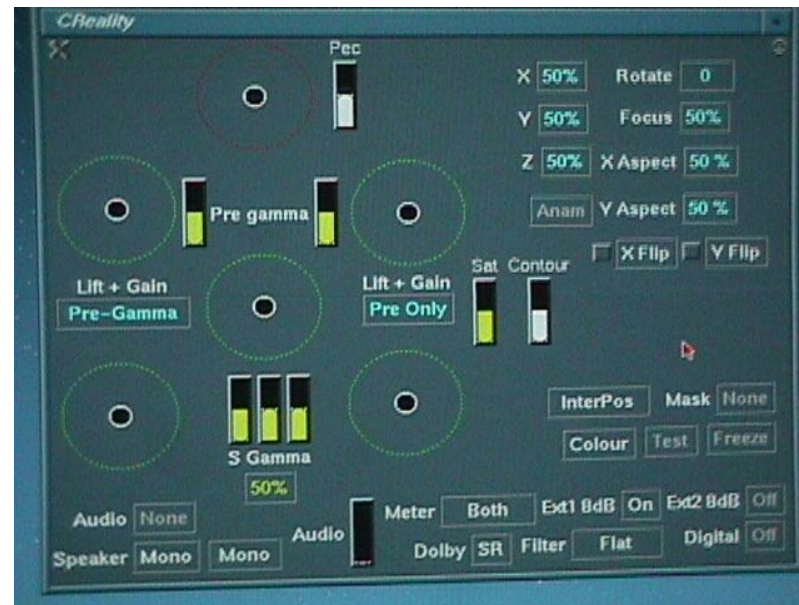
Turn the master PRE Gain control down significantly such that the white level can be seen easily on a waveform. See fig. 12a, 12b &12c.

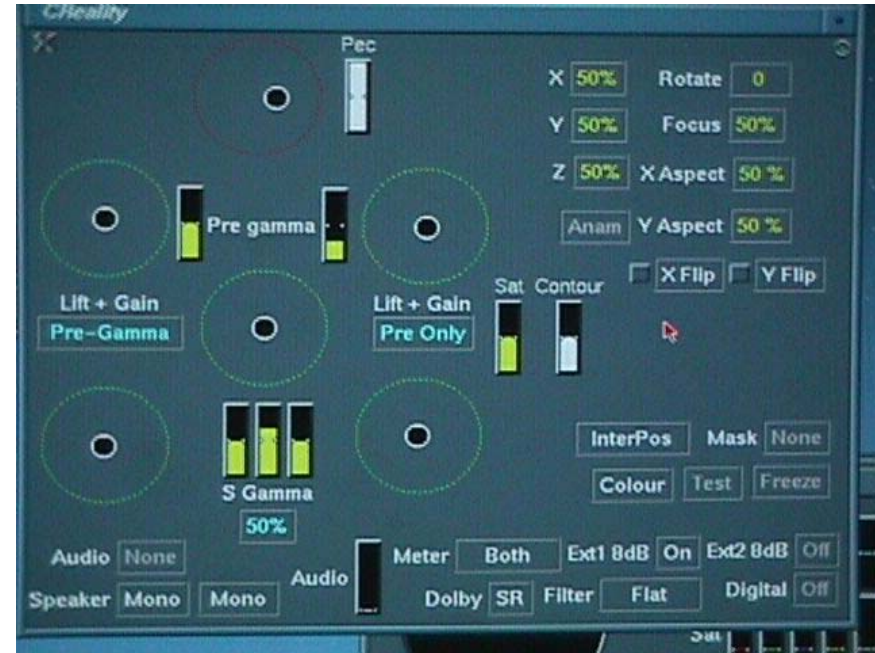Fig. 12a – Typical Da Vinci Settings for PEC set

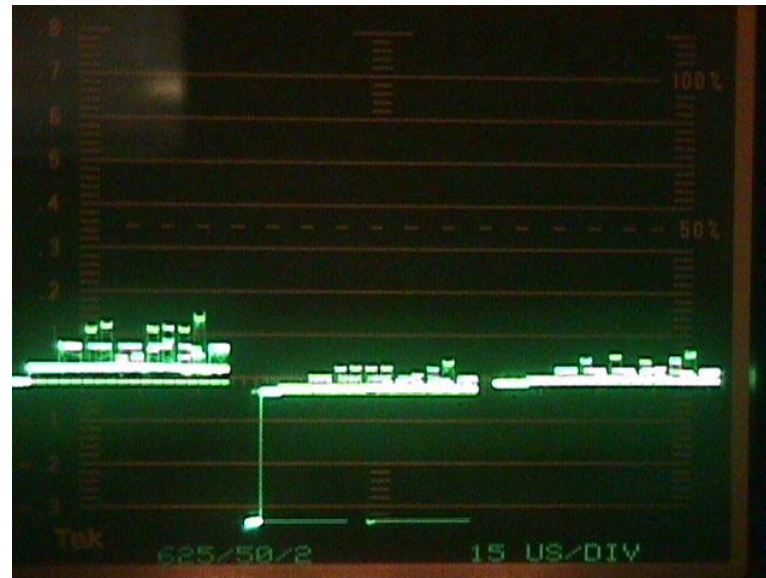
Fig. 12b – Typical Pandora Settings for PEC set

Fig. 12c – Typical view with PRE gain turned down

12.12   Stage 2. – INTER-POSITIVE FILM TYPE

Adjust the RG & B PEC/APD controls such that the signals head towards white i.e. you appear to be turning the signal levels UP. Continue to turn the signals UP until it is clear that the video is becoming white clipped. N.B. At this stage we are ONLY interested in the whites of the signal. See fig. 13
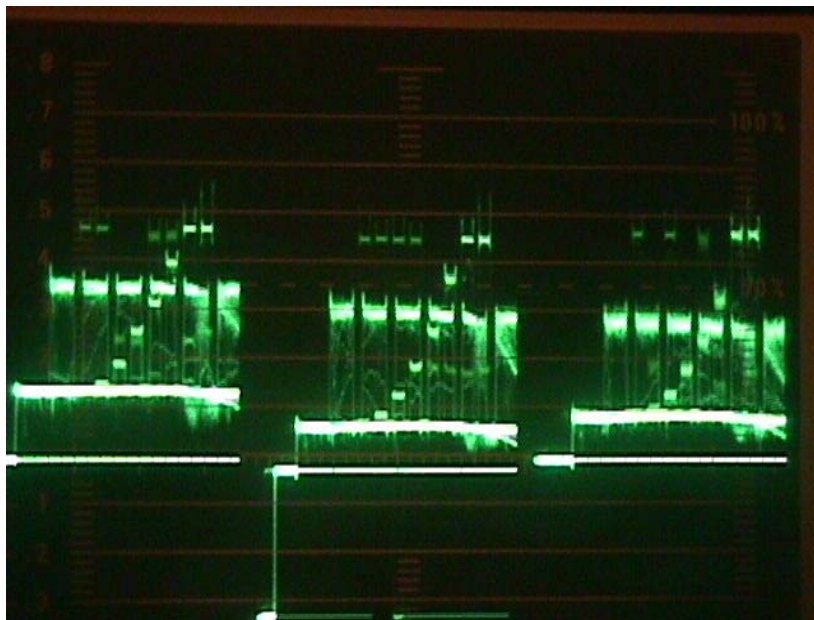

Fig. 13 – R,G & B white levels clearly in clip.   Fig. 14 – PEC levels set correctly with headroom
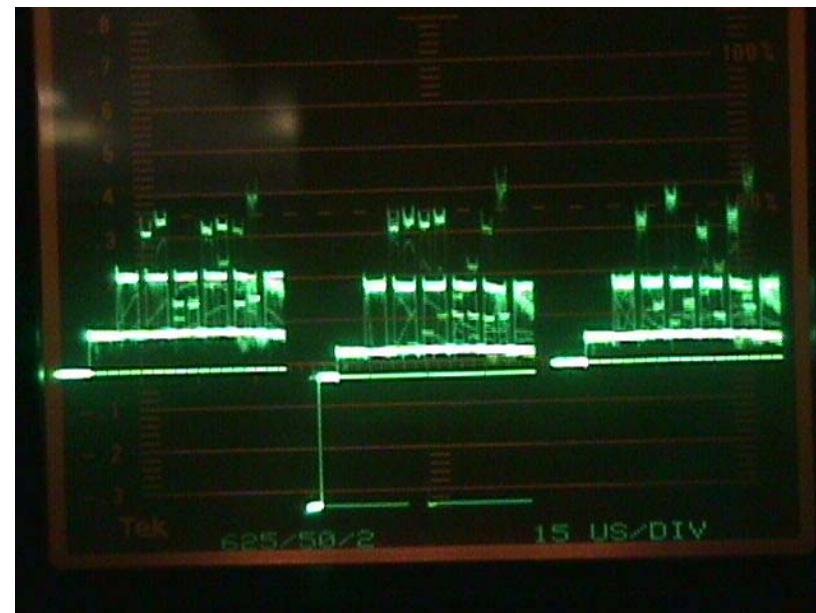
If you do not see something similar to that shown in the figure above it may be that you need to turn the PRE Gain controls further down and readjust your PEC controls.

12.13   Stage 3. – INTER-POSITIVE FILM TYPE

.
Now you have established where the detector clip point lies. N.B. operating in this area will result in some loss of picture information, it is now necessary to turn the signals Down until the clip point is cleared and some head room allowed for.
THIS IS THE OPTIMUM SETTING FOR YOUR PEC's, THEY SHOULD NOT BE RE-ADJUSTED for the rest of this procedure. Usually this setting will be sufficiently accurate to cater for the rest of a roll but if significant exposure changes occur, it should be re-checked. See Figure 14.

12.14   Stage 4. – INTER-POSITIVE FILM TYPE

The PRE Lift, Gain, and Gamma controls can now be returned to more usual levels such that the blacks and whites are unclipped and balanced. See Fig. 15a, 15b & 15c

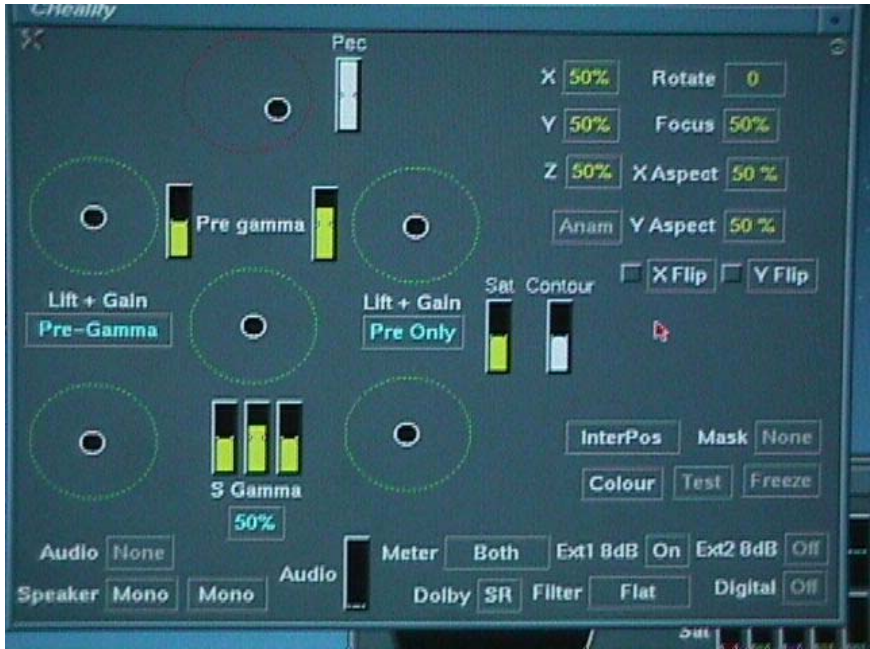Fig. 15a – Typical Da Vinci settings for PRE Gammas
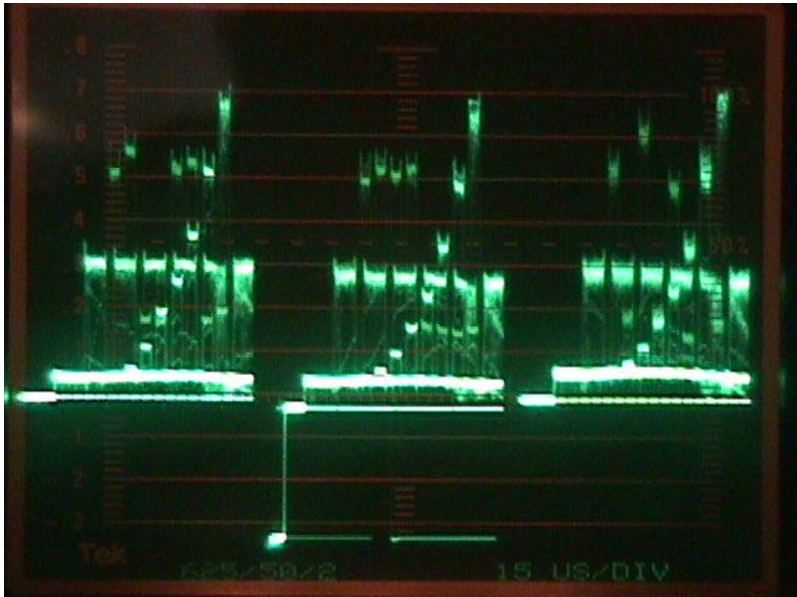

Fig. 15b Typical Da Vinci settings for PRE Gammas

Fig. 15c – Balanced RGB – Inter-Positive TAF (no Mask)

12.15   Stage 5. – INTER-POSITIVE FILM TYPE

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The PRE Gain and Lift controls can now be re adjusted for a 'Flat' grade – i.e. Balanced, unclipped Blacks and Whites. For C-REALITY users you can now switch into POST Gamma mode where creativity can take over from Technical set up!

Cintel recommend that a Base memory is created using the method described above and the latest Kodak Telecine Analysis Film (TAF).

13 OTHER FUNCTIONALITY

13.1   The user,may at this time, also wish to set default scan sizes and shapes. Bear in mind that when the C-REALITY scanner is correctly setup all scan sizes and shapes default to standards set by the film industry. Modifying these values for default storage in controllers will result in non standard scan areas being appied to the image.

13.2   For operation procedures of the optional Oliver and Grace please refer to the suppliment handbooks for these products.

13.3   For further descriptions of C-REALITY functions please refer to C-REALITY Appendix A.

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Chapter 5
Appendix A….   An explanation of some of the C-REALITY functions

Pre Gamma and Post Gamma Control.

C-REALITY includes a method of Primary colour correction that can always be optimised regardless of film density ranges.
Historically Film Scanners and Telecine colour correctors have had their input colour levels defined by detector adjustment and the film's density.

Where the film exposure is technically accurate such systems provide good results. However these results rely on a specific film density range representing the full image density range. While these densities can be accommodated differently between film types; negative, intermediate and print, it is not normally possible to   accommodate variable ranges within each film type.

With traditional systems where the "White point" and "Black point" of the image may vary in density, either due to a non technically perfect exposure, or for artistic effect, or for a non standard film stock, the final image blacks and whites may not correspond with the expected densities. This will also mean that intermediate densities may be misrepresented.
In such cases the White Level and Black level pivot points of the colour correction will be incorrect. If the Gamma is adjusted it will also move the black and white points rather than just the intermediate values.

C-REALITY overcomes these limitations by providing effectively two sets of Primary colour correction. The first corrector can be adjusted to ensure that regardless of film densities ranges a suitable White Point and Black Point can be presented to the Gamma correction and subsequent colour correctors such that these points are the genuine pivot points for the Lift Gamma and Gain of the second stage.

The first colour corrector is called, logically, Pre-Gamma while the second corrector is called Post Gamma.

For all operations it is best to set the Pecs such that the signal is just out of clip for the thinnest film densities, Black for Negative and White for Inter Pos and Print. Theoretically only three settings are required, one for each film type.

Now as different rolls of film or different shots are graded the pre gamma controls can be set to get the best range from the images. In the real world the following are recommended. For negative operation set the pre-gamma controls such that a full density range scene occupies the entire signal range. For IP and print set the Pre-gamma controls such that the image signal occupies the mid 75% of the entire range.

From this point on most control will only require Post Gamma operation. However if a scene is very flat it can be advantageous to re visit the pre-gamma controls to "boost" the range before the gamma control.

The Pre & Post gamma controls can be experimented with for other settings to obtain unique looks. However remember to reset to your normal values before grading a new job as it is possible to have extreme pre-gamma settings that will cause strange post gamma control.

Note. Clipping the blacks or whites in pre gamma mode will not necessarily clip the image blacks and whites in Post Gamma mode.

For more details see the main user manual Procedures 11 and 12.

PCC Gamma & Knee Functions

Normal Gamma
Stretch to lighten
Midtones and
 Lowlights

S Gamma.
Highlights and
Lowlights crushed
Mid Tones stretched

Knee on S Gamma
moved towards
Lowlight
Highlights Crushed.
Lowlights stretched
Blacks crushed

PCC, S Gamma, HighLight &LowLight modes

Inverted S Gamma
Mid Tones crushed
Highlights and
Lowlights stretched

Highlight Mode
Highlights
Compressed

Lowlight Mode
Lowlights
Compressed

CVIP Vector Selection, Isolation and Effect adjustment (Note these images will only show correctly if displayed or printed in colour)

Original Image   **Vector HSL selected using Highlight Mode**   **Effect Hue adjustment.**

Effect Hue and Saturation adjustment.   **Effect Hue, Saturation and Luminance adjustment**   **Additional Vectors selected and adjusted**

SCAN EFFECTS

X Skew
Vertical Edges all tilted same amount
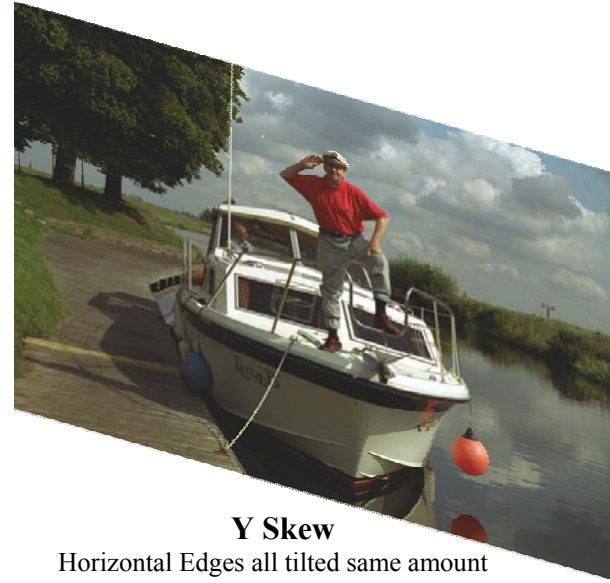
Y Skew
Horizontal Edges all tilted same amount

X Tilt
Size change Left to Right, correct Horizontal perspective

Y Tilt
Size change Top to Bottom, correct Vertical perspective

FOCUS EFFECTS

Fully Focussed

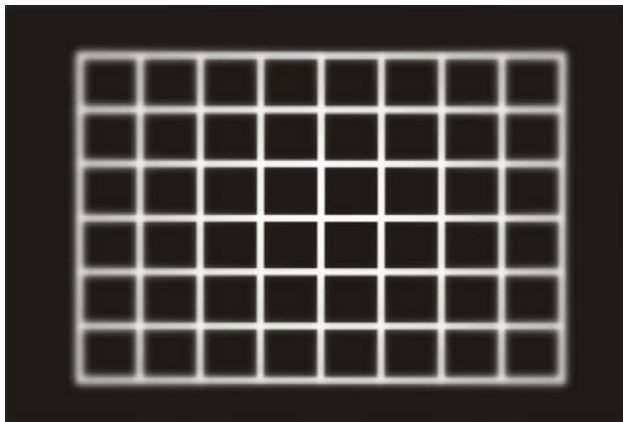Slight Defocus

Mass Defocus

SCAN ALIGN
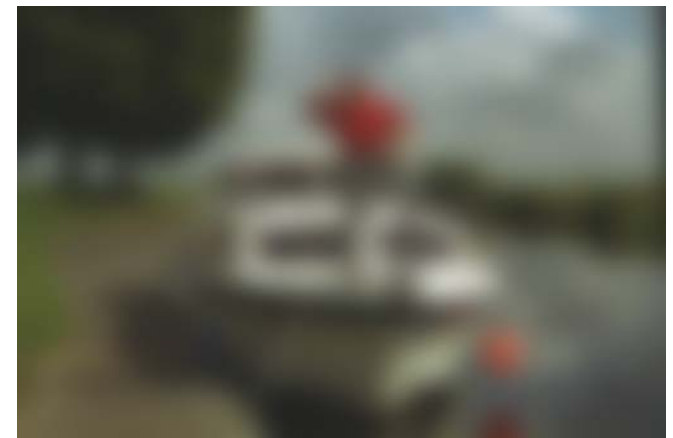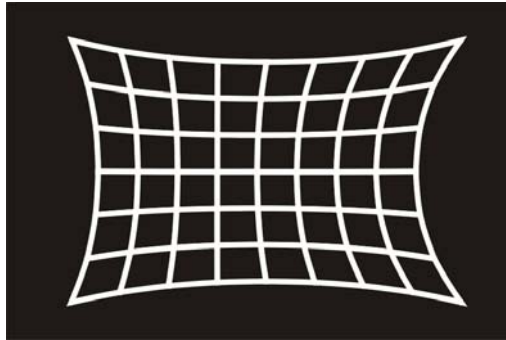
Pin Cushion
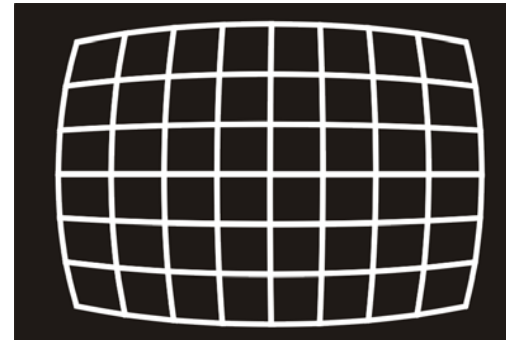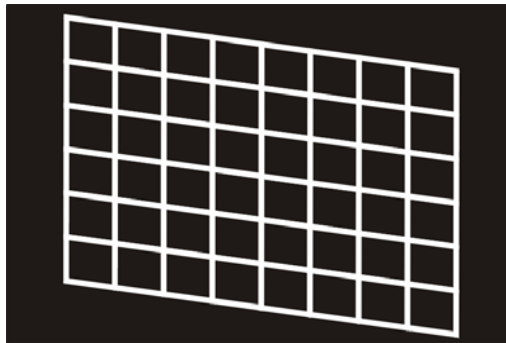
Y Skew
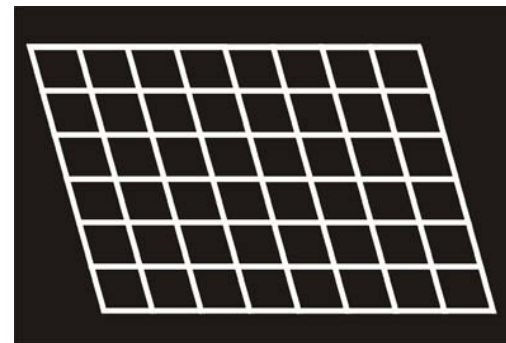
Skew

X Skew

Static Focus
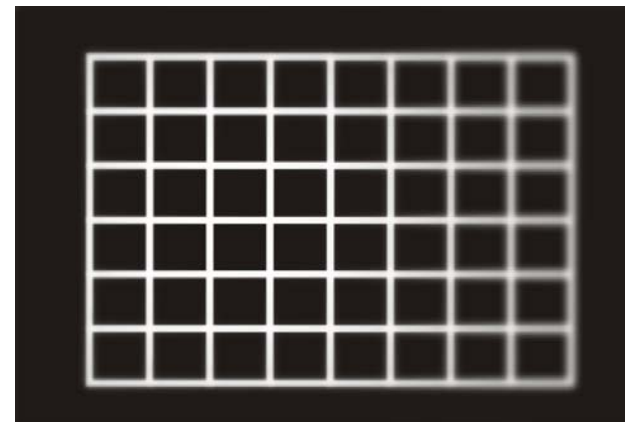
Dynamic Focus (LHS Shown adjusted)

ASTIG
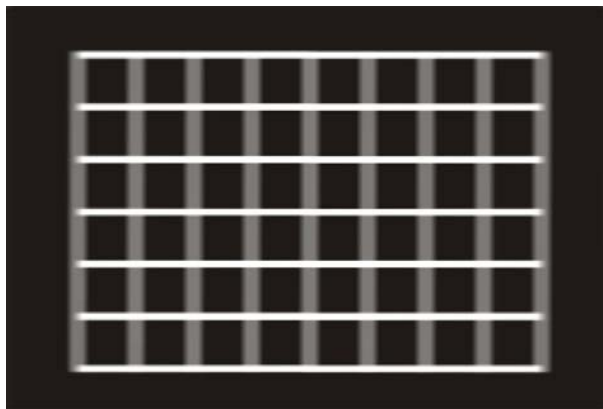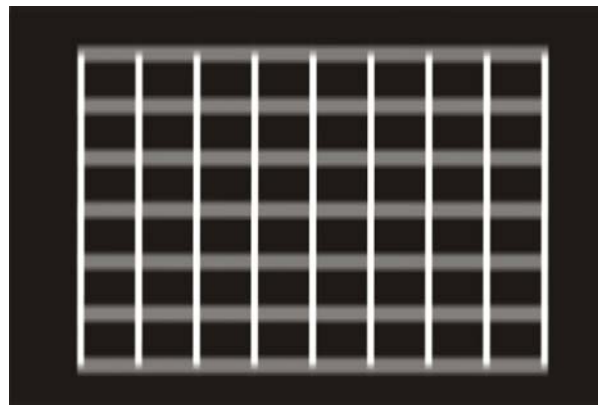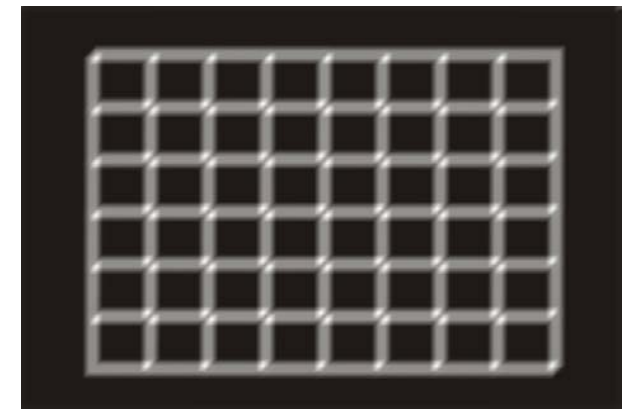

Bad   Bad   Good, Readjust Focus